

MINERALOGICAL ABSTRACTS

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Notices of Books.

NTZE (Carl) [1851-1916]. *Handbuch der Mineralogie. Gesamtregister* besorgt von K. F. CHUDOB. Berlin (Walter de Gruyter & Co.), 1939, 71 pp. [Price 18s.]

An alphabetical index to the set of volumes [M.A. 5-289, 7-58] giving a useful list of about 8000 mineral names. L. J. S.

ERSMAN (A. E.) Ферсман (А. Е.). Геохимия. Том IV. [Geochemistry, Vol. 4.] Госуд. Научно-Техн. Изд. Хим. Лит. [State Sci.-Techn. Publ. Chem. Liter.], Leningrad, 1939, 355 pp., 44 figs. Price 16 rub. 25 kop. (bound 18 rub.). [M.A. 6-337, 338; 7-5.]

This volume is devoted to the geochemistry of chemical elements. It contains a large number of tables and other numerical data. Apart from a short introduction, the main part of the book contains the description of chemical elements in their geochemical relations (distribution, association, minerals, paragenesis). Important references to literature and a short glossary of the terms used are given. S. I. T.

KEE (James) [1839-1915]. *Structural and field geology for students of pure and applied science*. 5th edition revised by Robert CAMPBELL and Robert M. CRAIG. Edinburgh and London (Oliver and Boyd), 1940, xxiv+395 pp., 69 pls., 147 text-figs. Price 25s.

This fifth edition of a useful text-book closely follows in matter and the first edition of 1905 and the fourth edition (revised by R. Campbell) of 1920. Rather than showing an increase in size, there is a diminution of fifty pages, largely owing to the omission of the last chapter of previous editions on Geological structure and surface features. The first five chapters (91 pp.) on Rock-forming minerals and on Rocks that on Alteration and metamorphism have been rewritten. Other chapters deal with Structures of various kinds, Ore-formation, Geological surveying, Economic aspects of geological structure, Soils and soils, &c. The many plates, mostly representing Scottish scenery, and the very clear diagrams add much to the attractiveness of the volume. L. J. S.

MIALL (Stephen). *A new dictionary of chemistry*. London, New York and Toronto (Longmans, Green & Co.), 1940, xv+575 pp., 13 figs. Price 42s.

This is a useful and handy volume for quick reference. In some 4500 short articles with numerous cross-references much information is clearly given of chemical substances, terms, and processes, and there are many interesting biographical notices of chemists. A few mineral and crystallographic articles are included. Here undue prominence is given to crystal-structure (which is neglected for most other substances), while important mineralogical information is lacking or often erroneous. There are a few unnumbered diagrams are, with one or two exceptions, of the crystal structure of minerals. Structural formulae of carbon compounds are freely given, which in their complexity resemble diagrams. The material has been compiled by 27 contributors with S. Miall as editor. L. J. S.

EVANS (John W.) [1857-1930] & DAVIES (George M.). *Elementary crystallography*. 2nd edition. London (Thomas Murby & Co.), 1937, vii+149 pp., 203 figs. Price 6s.

The second edition of this useful text-book is just the same as the first edition of 1924 [M.A. 2-241] with the addition of a new chapter of 15 pages giving a brief account of X-rays and crystal-structure illustrated by 22 clear diagrams. L. J. S.

New Minerals.

PALACHE (Charles) & FISHER (D. Jerome). *Gratonite—a new mineral from Cerro de Pasco, Peru*. Amer. Min., 1940, vol. 25, pp. 255-256, 5 figs.

RUST (George W.). *Geologic occurrence of gratonite at Cerro de Pasco, Peru*. Ibid., pp. 266-270, 10 figs.

Gratonite [M.A. 7-263] forms radiating aggregates of lead-galena needles and hexagonal prisms with rhombohedral terminations, which in habit and angles ($\alpha = 27^\circ 41'$, $a:c = 1:0.4428$) much resemble to malachite. Analyses by F. A. Gonyer (and the Cerro de Pasco laboratory) gave: S 17.38 (18.01), As 10.82 (10.60), Sb 0.21 (0.08), Pb 71.12 (70.00), Fe 0.39 (n.d.), totals 99.92 (99.48), sp. gr. 6.22 (6.1). The hexagonal unit cell ($a = 17.69$, $c = 7.83$ Å., space-group $C_{3v}^6 = R\bar{3}m$) contains $3(9Pb_2As_2S_3)$, and the rhombohedral cell ($a = 10.54$ Å., $\alpha = 114^\circ 5'$) contains $Pb_9As_4S_{15}$. The mineral occurs with Pb-Zn ores and is a product of the alteration of galena during the period of the Cu-Ag-Au mineralization. L. J. S.

RSEN (Esper S., 3rd). *Overite and montgomeryite: two new minerals from Fairfield, Utah.* Amer. Min., 1940, vol. 25, pp. 315-326, 3 figs.

These are found as minute, green to colourless crystals in the variscite lules from which many allied phosphates have already been described [A. 4-343]. Revised data for overite [M.A. 7-224] are: $a : b : c = 864 : 1 : 0.3795$, flattened on (010) and with perfect (010) cleavage; unit-cell dimensions a 14.75, b 18.74, c 7.12 Å., space-group $D_{2h}^{21} = Bmam$. From F. A. Gonyer's analysis, P_2O_5 37.91, Al_2O_3 27.99, CaO 11.62, H_2O 22.04, insol. 0.11 = 99.67, the formula is now given as $Al_8(PO_4)_8(OH)_6.15H_2O$. Montgomeryite is monoclinic with $a : b : c = 145 : 1 : 0.2580$, β $88^\circ 26'$, laths on (010) and perfect (010) cleavage; sp. gr. 2.53, H. 4, α ($= c$) 1.572, β ($= a$) 1.578, γ ($= b$) 1.582, $2V$ $75^\circ \pm 10^\circ$, refractive. Analysis by F. A. Gonyer gave P_2O_5 37.70, Al_2O_3 21.32, H_2O 19.07, H_2O 21.65 = 99.74. The unit-cell, of dimensions a 9.99, b 14.10, c 6.25 Å., contains $2[Ca_4Al_5(PO_4)_6(OH)_5.11H_2O]$; space-group $C2/c$.
L. J. S.

MDOHR (Paul) & ÖDMAN (Olof). *Falkmanit, ein neues Bleispießglanzerz, und sein Vorkommen, besonders in Boliden und Grube Bayerland. (Mit einem Beitrag zur Kenntnis des Geokronits.)* Neues Jahrb. Min., Abt. A, 1940, Beil.-Bd. 75, pp. 315-350, 4 pls., 2 text-figs.

Falkmanite [M.A. 7-468] occurs as bundles of lead-grey needles, closely resembling jamesonite and boulangerite, in the Bayerland mine in Bavaria, Boliden in Sweden, and Minas Geraes in Brazil. The X-ray powder photograph closely resembles that of boulangerite, but with different intensities for some of the lines, and a Laue photograph shows monoclinic (rather than orthorhombic) symmetry. Microscopical characters in reflected polarized light are intermediate between those of jamesonite and boulangerite. Sp. gr. 6.24, H. $2\frac{1}{2}$. Analysis by T. Bergström of material from Bavaria gave S 19.32, Se 0.42, As 1.00, Sb 22.48, Pb 4.16, Cu 52.97, Fe 0.50, Ag 0.002, Au < 0.001 , insol. 0.56, total 99.93; deducting Cu and Fe as bournonite and mispickel, this agrees approximately with $Pb_3Sb_2S_6$. Massive geocronite occurring in association at the Bayerland mine gave S 16.92, Se 0.71, As 5.03, Sb 4.43, Bi 0.03, Pb 67.92, Cu 0.56, Fe 0.10, Ag 0.37, Zn 0.22, insol. 0.07, total 100.36, agreeing with Pb_5AsSbS_8 . Monoclinic crystals of geocronite [M.A. 7-231] show a relation to jordanite.
L. J. S.

RAMDOHR (Paul) & THILO (E.). *Stiepelmannit, ein neues Mineral Hamlinitgruppe mit Yttrium und seltenen Erden*. Zentr. Min., Abt. 1940, pp. 1-8, 2 figs.

Small, colourless to pale wine-yellow crystals, thickly coated with hyalite and limonite, occur with gem minerals and yttrifluorite pegmatite at Klein Spitzkopje, South-West Africa. They are rhombohedra with truncated corners, resembling cubo-octahedra; forms (10 $\bar{1}$ 02 $\bar{1}$), (0001), rr' 91° 43', $a:c = 1:1.272$. Sp. gr. 3.671-3.713, $H\omega$ 1.695₄, ϵ 1.705₄ (Na). X-ray measurements by H. Strunz give a 9.54 Å. $\alpha \pm 90^\circ$ (a 6.75, c 16.52 Å.) containing 4 mols. Analysis E. Thilo, P_2O_5 (26.94), SiO_2 0.29, X_2O_3 (mol. wt. 326) 29.25, ZrO_2 1. CaO 0.50, Al_2O_3 30.83, H_2O 11.07 = 100.00, gives the formula $(Yt, Yb, Zr, Ca)PO_4 \cdot AlPO_4 \cdot 2Al(OH)_3$. The mineral belongs to the alundantite-hamlinite group and is similar to florencite with Yt and (about 4:5) in place of Ce. Some discrepancies in the crystal-structure of minerals of this group [M.A. 7-87, 88] are commented upon. L. J. S.

LAVES (Fritz). *Über den Einfluß von Spannungen auf die Regelung Quarz- und Cristobalit-Kriställchen im Chalcedon, Quarzin Lussatit*. Naturwiss., 1939, vol. 27, pp. 705-707, 1 fig.

Cryptocrystalline silica is subdivided into chalcedony and quartzine lussatite and lussatine, of which the first pair consist of fibrous quartz and the last pair of fibrous cristobalite (of the cubic high-temperature modification, but tetragonally deformed); in chalcedony and lussatite the fibres have optically negative elongation and in quartzine lussatite positive. The formation of chalcedony or lussatite on the one hand, of quartzine or lussatine on the other, is dependent on stress during crystallization, which is regarded as taking place in a gel, the crystals being always arranged with their c -axes parallel to the direction of tension or perpendicular to that of pressure; accordingly botryoidal material is almost always chalcedony or lussatite, contraction causing tension parallel to the surface, whilst in a more massive specimen, contraction at crystallization centres gives rise to quartzine spherulites embedded in lussatine. The blue 'chalcedony' of Weitendorf, Styria is lussatite.

M. H. F.

LOZHECHKIN (M. P.) Ложечкин (М. П.). *New data on the chemical composition of "gold cupride"*. Compt Rend. (Doklady) Acad. Sci. USSR, 1939, vol. 24, pp. 451-454, 3 figs.

'Gold cupride' from the Karabash gold-ore deposit, Soimon valley, Urals, is not a homogeneous mineral but consists of two intergrowths.

ponents: gold argentide (AgAu_4) and cuproauride (Cu_3Au_2). Chemical analyses and X-ray data are given.

S. I. T.

CHIRVINSKY (P. N.)] Чирвинский (П. Н.). Палеогидрогеология Хибинских тундр.—CHIRVINSKY (P. N.). *Palaeohydrogeology of Khibina tundras*. Изв. Акад. Наук СССР, Сер. Геол. (Bull. Acad. Sci. URSS, Sér. Géol.), 1939, no. 4, pp. 23-43, 4 figs. (Russian with English summary.)

The term 'palaeohydrogeology' refers to the study of hydrothermal veins. The following minerals from hydrothermal veins of the Khibina tundra are described or mentioned: spreustein, ranite, natrolite, yuksopite, mesolite, ussingite, cancrinite, analcime, chabazite, heulandite, pectolite, apophyllite, foshallassite, steenstrupine, biotite, scorrite, fersmanite, apatite, sphene, astrophyllite, gibbsite, saponite, rhodotite, galena, blende, pyrite, marcasite, chalcopyrite, rinkolite, provudyavrite, carbocer, native copper, catapleiite, calcite. An analysis of a new mineral *kalisaponite* gave SiO_2 57.80, Al_2O_3 20.80, FeO 0.23, MgO 2.17, CaO 1.66, Na_2O 0.58, K_2O 6.57, H_2O nil, P_2O_5 trace, $\text{H}_2\text{O} + 4.45$, $\text{H}_2\text{O} - 6.57 = 100.83$. Analyses of the other minerals are also given. The processes of hydrothermal formation of minerals and especially of spreusteinization are discussed.

S. I. T.

DELETZKY (I. D.). *Gedroizite in the alkali-soils*. Compt. Rend. (Doklady) Acad. Sci. URSS, 1939, vol. 23, pp. 565-568, 3 figs.

X-ray study of the 0.2-2 μ fraction of an alkali soil from the Chernigov district, Ukraine, showed the presence of the compound gedroizite, $(\text{H}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot 3\text{SiO}_2 \cdot 2\text{H}_2\text{O})$, hitherto only obtained synthetically. [M.A. 100.]

M. H. H.

LOGH (Ernö). *Protokálcit. Egy új ásvány.—Protocolcit. Ein neues Mineral*. Erdélyi Múzeum, Kolozsvár (= Cluj), 1937, vol. 42, pp. 147-155. (Hungarian with German summary.)

A mould-like encrustation of CaCO_3 on limestone walls and stalactites in the Komarnic cavern in the Banat mountains consists of a loose aggregate of minute (0.5 mm. long and 1-3 μ thick) needles which give oblique optical extinction, and therefore thought to be monoclinic or triclinic. [This is evidently the lublinitic variety of calcite in which the crystals are elongated along a rhombohedral edge. M.A. 4-157, 334; 1008.]

L. J. S.

PEACOCK (M. A.). *Goldschmidtine identical with stephanite*. Amer. Min. Soc. Trans., 1940, vol. 25, pp. 372-373.

Goldschmidtine [M.A. 7-15, 317], recently described as a silver antimonide, is now found to be identical with stephanite. A new analysis gave S 15.6, Sb 14.4, Ag 68.1 = 98.1, and the crystallography is in agreement. L. J. S.

Precious Stones.

SMITH (G. F. Herbert). *Gemstones*. 9th edit., London (Methuen & Co.) 1940, xvii+443 pp., 42 pls., 101 text-figs. Price 18s.

This well-known text-book [M.A. 2-98] has been almost entirely rewritten. The general plan of the previous editions, however, has been retained and the treatment preserves many original qualities. The author has wisely drawn on new data supplied by B. W. Anderson and has been fortunate in assistance given by trade experts. Anderson's measurements of the absorption spectra of gemstones given in chapters of part I form an important addition to our knowledge of the physical characters of minerals and much of the careful work on refractive indices and dispersions from his laboratory has also been embodied in part IV. Amongst other welcome additions are fuller treatment of crystal optics in part I, and new chapters on geographical distribution and prices, Bible stones, historical stones in part II, a further chapter on gem minerals, and a separate chapter on the pearl, including an account of the endoscope and X ray testing, in part III. The production of such a volume during the war has led to some compression of the text and misplacing of several plates. The balance might have been restored with advantage by reducing the number of plates, particularly some of the reproductions of Laue photographs and the less interesting pictures of the Kimberley mines. F. A. B.

DRAGSTED (A.). *De ædle stene og deres mystik*. Kjøbenhavn (Arnolds Busck), 1933, 239 pp.

The larger part (pp. 18-152) of this volume gives brief accounts of the several kinds of gemstones in alphabetical order from alexandrite to zircon. This is followed by general remarks on mineralogical characters, occurrence, geographical distribution, working, &c. The 'mystik' is limited to short sections on supposed psychic, medicinal, and astrological attributes, and the gemstones mentioned in the Bible. L. J. S.

AXTER (William T.). *Jewelry, gem cutting, and metalcraft*. With a section on *Identification of gem stones* by Henry C. DAKE. New York and London (Whittlesey House, McGraw-Hill Co.), 1938, xii+224 pp., 128 figs.

The main part of this small well-illustrated volume is devoted to metalwork in the fashioning of jewellery, with 46 pages on the cutting of gemstones and 32 pages on the methods for their identification. It is intended for the home craftsman. The author is instructor in art metalwork and jewellery in the Woodrow Wilson High School in Washington, D.C. A list is given of dealers in supplies for amateurs. L. J. S.

UDOBA (Karl F.). *Bezeichnungsübersicht und Bestimmung der Schmucksteine*. Leipzig (Wilhelm Diebener), 1939, 35 pp., 3 pls. (Reprint from the *Deutscher Goldschmiede-Kalender* 1939.)

Half of this pamphlet is occupied by a list of about 800 names, mineralogical and popular, of gem materials, giving a brief definition and the derivation of each. Essential characters of the more important minerals are tabulated, and specific gravities and refractive indices are recorded on graphs. Determinative tables, based on colour, sp. gr., and hardness, are added. L. J. S.

SCHLAEGEL (Herbert). *Trade dictionary of precious metals, gemstones, jewellery and horological products*. La Haye (Mouton & Co.), 1939, 773 pp.

The title-page and explanatory introduction to this volume appear in eight languages. Eight alphabetical lists, respectively in French, English, German, Italian, Spanish, Portuguese, Czech, and Dutch, are given of technical terms. Words in each list are numbered (up to 5627 in English), and under each entry the numbers for the equivalent terms in all the other languages are quoted. The dictionary has been compiled under the auspices of the 'B.I.B.O.A.' [M.A. 6-197]. L. J. S.

HOSSMACHER (K.). *Ein Juwelermikroskop*. Zentr. Min., Abt. A, 1939, pp. 290-292, 1 fig.

The microscope tube is mounted horizontally for convenience of examining a faceted stone when immersed in a trough of liquid of the same refractive index as that of the stone. The stone is held in a press-capable of rotation. L. J. S.

EPPLER (W. Fr.) & KLÜPPELBERG (E.). *Der praktische Brillantschliff Diamanten*. Neues Jahrb. Min., Abt. A, 1939, Beil.-Bd. 75, pp. 13-144, 7 figs.

In the 'practical' brilliant-cut diamond a cylindrical surface is brushed on the stone between the upper and lower conical surfaces, preliminary to the grinding of the facets. The tendency is to increase the thickness of the girdle (so increasing the weight of the cut stone), and this involves a deviation from the dimensional proportions and angles of the facet from the 'ideal' brilliant form. Tables of calculated proportions and angles are given.

L. J. S.

BERGHEIMER (H.). *Die Schleifrichtungen auf den Facetten des Diamanten*. Neues Jahrb. Min., Abt. A, 1939, Beil.-Bd. 75, pp. 14-158, 10 figs.

Diagrams and a table show the grinding directions of least hardness on each of the facets of a brilliant. These directions are different for 4-, 3-, and 2-point stones, i.e. whether the table facet is parallel to (100), (111), or (110) respectively. A special guide and holder enable the stone to be turned into the required direction for grinding.

L. J. S.

EPPLER (W. Fr.). *II. Beitrag zum Brillanzproblem*. Zentralbl. Mineral., Abt. A., 1940, pp. 93-96, 1 fig.

The proportions and angles of the facets, and the percentages of light reflected and lost, are tabulated and compared for the different types of brilliant-cut in diamond: the 'ideal' [M.A. 7-125], the form to give the maximum brilliancy [M.A. 7-329], and that of M. T. Skowsky (Diamond design, London, 1919).

L. J. S.

PAYNE (C. J.). *Dispersions of some rarer gemstones*. Gemmologist, London, 1939, vol. 9, pp. 33-35.

The following determinations were made on faceted stones by the prism method for wave-lengths 6708 (Li) to 4227 (Ca, g), and from them the dispersion B-G, red to violet (6878-4308), is calculated.

			n_D	Li-g.	B-G.	Sp.
Benitoite: California...	...	...	ϵ 1.7547	0.0403	0.0395	—
			ω 1.8024	0.0477	0.046	
Cassiterite: Malaya ...	...	...	ω 2.0031	0.0731	0.071	6.98
			ϵ 2.1003	0.0661	0.064	
Danburite: Mogok, Burma ...	...	...	β 1.6338	0.0160	0.0157	3.00
Datolite: Westfield, Mass. ...	...	...	β 1.6524	0.0169	0.0165	2.99
Euclase: Minas Geraes ...	...	...	α 1.6554	0.0166	0.016	3.05
			γ' 1.6694	0.0167	0.016	

	n_D	Li-g.	B-G.	Sp. gr.
tschermakite: Maharitra, Madagascar	β' 1.5880	0.0156	0.015	2.35
	γ 1.6295	0.0178	0.017	
tschermakite: Canada	ω 1.7080	0.0193	0.019	3.385
tschermakite: Madagascar	β 1.6764	0.0192	0.019	3.32
tschermakite: Minas Geraes	ω 1.6552	0.0156	0.015	2.95
	ϵ 1.6713	0.0162	0.016	
tschermakite: Sierra da Chibita, Rio	ϵ 1.5556	0.0155	0.015	2.711
tschermakite: Brazil	ω 1.5769	0.0170	0.0166	
tschermakite (golden): Indo-China	ω 1.9256	0.0396	0.0383	4.697
	ϵ 1.9850	0.0410	0.0396	

L. J. S.

ANDERSON (B. W.) & PAYNE (C. J.). *The constancy of quartz and other minerals*. Gemmologist, London, 1940, vol. 9, pp. 93-96, 119-121. Careful determinations are given of the density and refractive index of minerals that show little variation, especially when pure and of gem quality, and the following values are listed for use as standards.

	d_4^{15}	n_{Na}
Diamond... ..	3.516	2.418
Quartz	2.651	1.544, 1.553
Corundum	3.989	1.760, 1.768
Fluorite	3.182	1.434
Calcite	2.710	1.486, 1.658

The values for corundum are for colourless artificial material; for a coloured artificial stone d 3.990; colourless natural corundum 3.984; for coloured natural gems 3.99-4.01.

L. J. S.

CH (S. R.). *Notes on inclusions in gem-stones*. Gemmologist, London, 1940, vol. 9, pp. 69-72, 81-83, 97-99, 112-115, 15 figs. A general account of gaseous, liquid, and solid inclusions in crystals, with details concerning the inclusions characteristic of various gemstones.

L. J. S.

LL (Sydney H.). *The diamond industry in 1938*. Jewelers' Circular-Keystone, New York, July 1939. Reprint 16 pp., 2 figs. Gemmologist, London, 1939, vol. 9, pp. 8-11, 25-28, 38-39, 52-54. Statistics of production and imports, with details of work in each mining area.

L. J. S.

AUS (Edward H.) & SLAWSON (Chester B.). *Variation of hardness in the diamond*. Amer. Min., 1939, vol. 24, pp. 661-676, 28 figs. The variation of hardness in diamond is deduced from its crystal-structure. The optimum directions for polishing any face are parallel

to crystallographic axes. The hardness depends upon the reticular density and therefore increases in the order (100), (110), (111), being greatest on the octahedral faces. A consideration of the reticular density and the valency bonds shows that cleavage should take place most readily parallel to (111) and also that there should be a possible cleavage parallel to (110). Stereographic projections of a two-point and a four-point brilliant are reproduced showing the variation of hardness on the crown and pavilion facets.

F. A. B.

GROVES (L. G.) & MARTIN (A. E.). *The dielectric constant of diamond*. Trans. Faraday Soc., 1940, vol. 36, pp. 575-581, 4 figs.

The values obtained by two methods are 5.26 and 5.35, the latter being the preferred figure. No difference was observed in the dielectric constants of the two types of diamond described by Robertson, F. and Martin [M.A. 6-6, 494].

L. J. S.

WILLIAMS (G. J.). *The kimberlite province and associated diamond deposits of Tanganyika Territory*. Bull. Geol. Div., Dept. Lands and Mines, Tanganyika Territory, 1939, no. 12, 38 pp., 2 sheets of maps, 3 pls. Price 3s.

Forty-four kimberlite pipes have been located in the area extending some 150 miles southwards from Lake Victoria. Full details are given of the geology and the work done at several of these. The pipes penetrate granite or sometimes the basement schists into which the granite was intruded, and they are usually marked by a clay pan. Few diamonds in several pipes none, are found in the kimberlite, working of which is unpayable. They have been obtained from gravels, or rather angular rubble resulting from surface weathering, in the neighbourhood of the pipes, true alluvial deposits being scarce. 90 % of the total output (106,082½ carats during 1923-37) has come from gravels around the Mabuki pipe. The diamonds are mostly small, averaging less than 1 carat; the largest, 92½ carats, came from Kisumbi in the Shinyanga district. Other deposits described are those of Mwamanga, Usongo, and Singida. The kimberlite is of the same character and probably of the same age as that of South Africa. It contains abundant xenoliths of the local rocks, together with ilmenite, olivine, chrome-diopside, garnet, zircon, perovskite, and nodules of eclogite. 'Blue ground' is covered by about 10 feet of 'yellow ground', but in places 'hardebanks' outcrop at the surface. Hints are given for prospectors and areas suggested for future work. [M.A. 4-182, 5-277.]

L. J. S.

OKY (G. B.) & LEMMLEIN (G. G.) Боккий (Г. Б.) и Леммлейн (Г. Г.).
Diamantkristalle vom Flusse Polydenka aus dem Bezirk Tschusowskoy.
 Compt. Rend. (Doklady) Acad. Sci. URSS, 1939, vol. 24, pp. 929-930, 4 figs.

Since the discovery in 1929 of diamond in the Chusovsk district Govt. Perm] 250 small crystals have been collected. They have the form of rhombic-dodecahedra with rounded and corroded faces. Stereographic projections are given of the reflected light figures around (110). [L.A. 7-330.] L. J. S.

SHAFFRANOVSKY (I. I.)] SCHAFFRANOWSKI (I. I.), Шафрановский (И. И.).
Zur Kristallographie der Diamanten brasilischen Typus. Compt. Rend. (Doklady) Acad. Sci. URSS, 1940, vol. 26, pp. 662-665, 2 figs.
 Most crystals of diamond from the Urals are of the 'Brazilian type', having the form of elongated rhombic-dodecahedra with rounded faces. These faces are marked by a groove along their shorter diagonal and they each reflect two separate triangular areas of light figures. The extent of these areas were measured on forty crystals. L. J. S.

NEED (Simon), McMURRY (H. L.), & ROSENBAUM (E. J.). *On some properties of white sapphire.* Journ. Chem. Physics (Amer. Inst. Physics), 1939, vol. 7, p. 853.
 A plate $2 \times \frac{1}{2}$ inch cut from artificial colourless corundum served as a window in apparatus for optical experiments on liquid HF. The material transparent to ordinary light and ultra-violet to about 1435 Å., and withstands corrosive liquids and gases. L. J. S.

HAUER (Anton). *Untersuchungen zur Kenntnis der spezifisch leichten Zirkone.* Neues Jahrb. Min., Abt. A, 1939, Beil.-Bd. 75, pp. 159-204, 4 pls., 12 text-figs.

X-ray powder photographs of low density green zircon from Ceylon (one of the three examined in detail gave SiO_2 33.01, ZrO_2 65.92, Fe_2O_3 0.20, CaO 0.16, $\text{Na}_2\text{O} + \text{K}_2\text{O}$ 0.07, $\text{H}_2\text{O} +$ 0.19 = 100.24, sp. gr. 4.220) and of malacon show them to consist of amorphous material (SiO_2 and ZrO_2) with sometimes some cubic ZrO_2 and only slight indications of any zircon structure. After heating to various temperatures, 100-1450°, the zircon pattern became progressively more pronounced and the density increased (but never up to that for normal zircon, 4.71). The same progressive change is shown by the solubility in HF; SiO_2 and ZrO_2 are soluble, while zircon only slightly (about 1 %). Attempts to prepare zircon artificially were unsuccessful; SiO_2 and ZrO_2 dissolved

in molten KBO_2 (which slowly volatilized at 1050°) yielded prismatic crystals with much the appearance of zircon, but these were shown by X-ray analysis to be monoclinic ZrO_2 . When zircon is heated at about 1650° , SiO_2 volatilizes, leaving cubic ZrO_2 (a 5.12 Å., sp. gr. 5.33). The specifically lighter zircons produce a darkening on a photographic plate in 25–30 days; and their metamict condition is no doubt due to radioactivity. [M.A. 7–130, 131.] L. J. S.

BOLMAN (J.). *Een groene zirkoon*. Chem. Weekblad, Amsterdam, 1933, vol. 36, pp. 752–753, 1 fig.

A yellowish-green faceted zircon of 3.265 carats from Ceylon has sp. gr. 4.132, and gave, by the prism method through the facets, refractive indices (Na): (1) in a direction perpendicular to the optic axis, ω 1.847; ϵ 1.8522; (2) along the optic axis 1.8397; (3) in an intermediate direction ω 1.8405, ϵ 1.8440. L. J. S.

STACKELBERG (M. v.) & ROTTENBACH (E.). *Dichte und Struktur der Zirkons. III. Die Natur der Lamellen-Zirkone*. Zeits. Krist., 1940, vol. 102, pp. 173–182, 4 figs. [M.A. 7–131.]

Some zircons consist of fine microscopic laminae parallel to (100). They are similar to plagioclase in appearance but cannot be due to twinning. In spite of the fact that the laminae persist when the crystal is heated till its density has its maximum value of 4.7, the authors think that the laminae are due to alternate layers of different densities caused by variations in the amount of radioactive material present. H. S.

STACKELBERG (M. v.) & ROTTENBACH (E.). *Dichte und Struktur der Zirkons. IV. Die Ursache der Isotropisierung des Zirkons*. Zeits. Krist., 1940, vol. 102, pp. 207–208.

In nature zircon becomes isotropic under the influence of radioactive emanations, decreasing in density from 4.7 to 3.9. A zircon plate, 1 millimetre square and 0.04 millimetres thick subjected in a laboratory to radioactivity broke down in four months as the result of the decrease in density of the side exposed to the radiation. H. S.

ANDERSON (B. W.) & PAYNE (C. J.). *Recent work on zircon. IV. The absorption spectrum of zircon*. Gemmologist, London, 1939, vol. 1, pp. 1–5, 1 fig. [M.A. 7–131.]

The absorption spectrum of zircon, discovered by A. H. Church in 1866, affords a practical test for identification. Zircons of different colours and from different localities show marked differences in the

intensity of the bands, and there is a difference between the spectra of the ordinary and extraordinary rays. Blue heat-treated zircon shows a weak spectrum and brown zircon from Burma the strongest. The wave-lengths of 41 bands are listed.

L. J. S.

POSTYLEVA (E.). *On the problem of the chemical constitution of zircons.*

Compt. Rend. (Doklady) Acad. Sci. URSS, 1939, vol. 23, pp. 167–169.

Pale brown zircon from Khibina, Kola, with sp. gr. 4.14 (4.23 after heating) and normal X-ray pattern, contains CaO 1.48, SO_4 0.75 %, and spectroscopic traces of Sr, Yt, Nb, Hf, and Th. It is heterogeneous, as shown by the zonal action of HF (75 % being soluble) and the zonal fluorescence in ultra-violet rays. Brown zircon from the southern Urals, sp. gr. 4.45 (4.79 after heating), shows the normal X-ray pattern and is not attacked by HF . Green zircon from Ceylon, sp. gr. 3.96 (3.90 after heating) shows, after heating, the lines of ZrO_2 and SiO_2 in the X-ray photograph, and it contains U_3O_8 0.65 %. Other specimens from Ceylon contain U_3O_8 0.21–1.19 %. The metamict condition of these zircons is due to the presence of uranium, which is perhaps also the cause of the green and black colour. [M.A. 7–130, 131.]

L. J. S.

ASHKAI (Mir-Ali). *On demantoid from the ultra-basic rocks of Azerbaijan.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1939, vol. 22, pp. 507–509, 1 fig.

Thin veins in metamorphosed serpentized dunite on Mt. Shah-Dag, Transcaucasia, are filled with scaly and granular demantoid, transparent and emerald-green in colour, rarely as small crystals (110). Analysis gave SiO_2 34.52, Al_2O_3 nil, Cr_2O_3 n.d., Fe_2O_3 31.33, MgO 0.72, CaO 0.42 = 99.99, sp. gr. 3.78, n 1.88 ± 0.03 .

L. J. S.

ANDERSON (B. W.) & PAYNE (C. J.). *Kornerupine from Ceylon: a new occurrence.* Nature, London, 1940, vol. 145, p. 266.

Kornerupine has been found in parcels of cut stones from Ceylon, and in a sample of gem-gravel concentrates consisting mostly of green zircon two small pieces were found. These are greenish-brown with sp. gr. 3.33, α 1.671, β 1.683, γ 1.684, $2V$ 25° , $r < v$, and pleochroism light-brown, β yellow, γ dark green.

L. J. S.

OLINSBEE (Robert E.). *Gem cordierite from the Great Slave Lake area, N.W.T. Canada.* Amer. Min., 1940, vol. 25, p. 216 (abstract).

Prismatic crystals ($4 \times 2 \times 2$ inches) of transparent cordierite, with

pleochroism from intense blue to clear yellow, occur in garnet-sillimanite gneiss and pegmatite north of Great Slave Lake. They are fracture but yield fragments of gem size and quality. L. J. S.

[VOSKОВОЙНИКОВА (N. V.)] Воскобойникова (Н.). К минералогии Слюдянского месторождения лазурита.—VOSKОВОЙНИКОВА (N. V.). *Mineralogy of the Sludianka lazurite deposit*. Зап. Всесоюз. Мин. Общ. (Mém. Soc. Russe Min.), 1938, ser. 2, vol. 67, pp. 601–622, 2 pls., 7 text-figs. (Russian with English summary.)

Lazurite is found along the borders and the cross joints of pegmatite veins intruded into marble at Slyudyanka, Siberia. Two analyses of lazurite are given. The optical properties are α 1.504, β 1.510, γ 1.512 V (+) 60°, and it is probably an orthorhombic variety. Other minerals from the pegmatite and contact marble are forsterite, diopside, feldspar, phlogopite, and scapolite. S. I. T.

MAURO (Francesco). *Pietre preziose e semipreziose delle Alpi Italiane*. [Riv. Sci. Nat., Natura, 1940, vol. 31.] Reprint, Milano, 1940, 23 pp., 2 pls.

Various occurrences of minerals representative of gem-stones in the Italian Alps, and several in the Swiss Alps, are mentioned. The colour plates illustrate faceted or cabochon-cut examples of scapolite, demantoid, prehnite, hessonite, idocrase, staurolite, kyanite, datolite, sphene, serpentine, violane, thulite, rose-quartz, obsidian, piedmontite, and rhodonite. L. J. S.

HANLEY (Franklin B.). *New accessibility to Thomsonite Beach, Minnesota*. Amer. Min., 1939, vol. 24, pp. 726–727.

— *Minnesota's Thomsonite Beach*. Rocks & Minerals, Peekskill, N.Y., 1939, vol. 14, pp. 371–376, 4 figs.

A new highway along the coast of Lake Superior renders more accessible the collecting ground, near Grand Marais in Cook Co., for the variegated zeolite pebbles (thomsonite, lintonite, &c.) that have been used as semi-precious stones. L. J. S.

HARGER (Harold S.). *A stone bead industry in the western Transvaal*. Trans. Roy. Soc. South Africa, 1940, vol. 28, pp. 129–142, 5 pls., 5 text-figs.

Beads of serpentine, gold, and copper, together with pottery and remains of iron smelting, have been found at the outcrop of a serpentine dike near Zeerust. They are probably the work of early Bantu people. L. J. S.

ALEXANDER (A. E.). *Pearl formation induced by a rotifer*. Amer. Journ. Sci., 1939, vol. 237, pp. 920-922, 1 fig.

A spinous, chitinous rotifer *Atrochus tentaculatus* (0.375 mm. long and 1.40 mm. wide) was found in a cavity in a freshwater pearl of 50 grains.

L. J. S.

ALEXANDER (A. E.). *An X-ray study of aragonite in natural and cultured pearls*. Amer. Journ. Sci., 1940, vol. 238, pp. 366-371, 3 pls.

Lauegrams taken in three directions at right angles enable natural and cultured pearls to be distinguished. An X-ray powder photograph of a natural pearl is identical with that of a crystal of aragonite. Thin sections examined microscopically show that in pearls the aragonite is made up of irregular laminae, whereas in mother-of-pearl it has a block structure.

L. J. S.

Colour of Minerals.

RAWSON (C. B.) & THIBAUT (N. W.). *Quantitative measurement of dichroism in tourmaline*. Amer. Min., 1939, vol. 24, pp. 492-498, 3 figs.

A prism of pale-green tourmaline from near Swakopmund, South-West Africa, was cut with its refracting edge parallel to the *c*-axis and at an angle of about 32°. The prism was mounted on a one-circle goniometer illuminated with a monochromator, and a cap nicol with graduated scale was fitted to the goniometer telescope. From the angle of rotation of the cap nicol needed to equalize the intensities of the extraordinary and ordinary rays the ratio of the relative intensities of the two rays when the tourmaline prism could be calculated. At only a few points in the middle of the spectrum does the percentage of the unabsorbed ordinary ray reach 10 % of the total light transmitted and this figure corresponds to a thickness of tourmaline of 1.35 mm. The dispersion of the ordinary and extraordinary rays between 440 and 671 $\mu\mu$ is 0.0130 and 0.0137 respectively. The corresponding dispersion of the double refraction is 0.001.

F. A. B.

EDENEJEVA (N.) & GRUM-GRŽIMAJLO (S.). *Das Spektropleochroimeter und Mineraleichroismusuntersuchung*. Compt. Rend. (Doklady) Acad. Sci. URSS, 1936, new ser., vol. 3 (of 1936), pp. 383-385, 1 fig.

An arrangement is described for quantitative measurements of the dichroism of a crystal plate in monochromatic light, at ordinary or high

temperatures. Results of its application to tourmaline are described. A pink tourmaline showed an irreversible change in dichroism at 425° C., a blue one at 275° C., a green one was stable up to 600° C.

M. H. H.

[КАПУСТИН (N. P.)] Капустин (Н. П.). Зависимость окраски амазонита от содержания в нем рубидия.—КАПУСТИН (N. P.). *The dependence of amazonite color on the content of rubidium*. Изв. АН СССР, Сер. Геол. (Bull. Acad. Sci. URSS, Sér. Géol.), 1939, no. 3, pp. 111–115. (Russian with English summary.)

Amazonite from various localities was proved to contain Rb₂O 0.17–1.89 and Cs₂O 0.003–0.020 %. The spectrophotometric measurements of amazonite show that the intensity of green colour is more or less proportional to the amount of rubidium present. [M.A. 6–377.]

S. I. T.

JAYARAMAN (N.). *The cause of colour of the blue quartzes of the charnockites of south India and of the Champion gneiss and other related rocks of Mysore*. Proc. Indian Acad. Sci., Sect. A, 1939, vol. 9, pp. 265–280, 1 pl.

Fuller details of previous work [M.A. 7–136]. The blue quartz contains TiO₂ 0.014–0.030, Fe (as oxide films in crevices) 0.001–0.002, loss on ignition 0.11–0.19 %; and the colourless quartz TiO₂ 0.001–0.002, Fe 0.001, loss on ignition 0.11 %. Both contain abundant (445,500 p.p.m.) minute needles of rutile, and the depth of the blue colour is proportional to the amount of colloidal TiO₂ shown as a brownish-yellow turbidity.

L. J. S.

HOFFMANN (Josef). *Färbungsursachen verschiedener Mineralsalze*. Chem. Erde, 1939, vol. 12, pp. 208–220.

The differences in colour of CuSO₄ containing varying amounts of water or as double salts with NiSO₄ and NH₃ are noted. Changes in colour shown by various substances when exposed to radium are discussed in relation to atomic structure. [M.A. 6–266.]

L. J. S.

PRZIBRAM (Karl). *Das Rätsel des blauen Steinsalzes II*. Kali, verwandte Salze und Erdöl, Halle, 1936, vol. 30, pp. 61–63.

A number of objections to the view that the blue colour of solar halite is due to lattice disturbance by radioactive radiations are considered and rejected. The colour of a yellow halite from Hall, Tirol, and

a blue anhydrite from Carinthia, violet anhydrite from Niedersachs-
 -en, Harz, and a violet langbeinite are due to the same cause.

M. H. H.

STEIN (H.). *Sur la couleur des cristaux de sel gemme artificiel*. Bull.
 Soc. Franç. Min., 1938, vol. 61, pp. 239-244, 2 figs.

Large single crystals of NaCl were grown by the method of S. Kyro-
 -ulos [M.A. 3-169] with a germ crystal attached to a water-cooled
 -dipped into molten NaCl. The crystals so obtained were usually
 -ourless, but sometimes pale pink. Spectroscopic analysis showed
 -at the colour was not due to impurities, and the ultra-microscope
 -owed the presence of minute light-scattering particles. These are
 -uggested to be free sodium, but the effect could not be obtained by
 -viously heating the material for some hours at 1000°, or by the
 -dition of metallic sodium.

L. J. S.

FRIEND (J. Newton) & ALLCHIN (John P.). *Blue rocksalt*. Nature,
 London, 1940, vol. 145, pp. 266-267.

Spectroscopic analysis of deep blue halite from Stassfurt showed the
 -sence of 23 parts per million of gold, and it was also detected in
 -e and pink halite from other localities. Blue-tinted anhydrite from
 -pwell Bishop, Nottinghamshire, contains 4 p.p.m. gold. It is sug-
 -ted that the presence of colloidal gold has some connexion with the
 -our of the mineral. [Min. Mag. 25-592.]

L. J. S.

FRERSSON (Hans). *Blue rock salt*. Nature, London, 1940, vol. 145,
 -pp. 743-744.

The amount of gold found by Friend and Allchin (preceding abstract)
 -alite is far in excess of that present in sea-water. One part of gold
 -million of halite would correspond to 25 mg. per ton of sea-water
 -suming that the proportion remains the same in both]; whereas the
 -gest amount found is 0.04 mg. in the east Greenland polar current,
 -in the South Atlantic surface water it is ten times less. [M.A. 7-435.]

L. J. S.

FRIEND (J. Newton) & ALLCHIN (John P.). *Colour of celestine*. Nature,
 London, 1939, vol. 144, p. 633.

Gold was found in pale blue (49), and more in deep red (85 parts per
 -million), celestine from Yate, Gloucestershire, while colourless crystals
 -tained none. More iron is present in the colourless (19) than in the
 -oured (4 p.p.m.) crystals. It is suggested that the colour of the
 -neral is due to colloidal gold. [Min. Mag. 25-589.]

L. J. S.

BROSSET (Cyrill). *Zur Frage der Schwärzung von Zinnober*. Naturwiss. 1936, vol. 24, p. 813.

The darkening of cinnabar in light has been shown not to be due to the formation of metacinnabarite. Metacinnabarite appears to be a metastable phase at all temperatures. M. H. H.

DREYER (Robert M.). *Darkening of cinnabar in sunlight*. Amer. Mineralogist, 1939, vol. 24, pp. 457-460.

Artificially prepared mercuric sulphide darkens on exposure to sunlight at rates which vary considerably for different modes of preparation. Also low-grade cinnabar darkens more readily than high-grade ore, some of which is stated not to darken after years of exposure. Small amounts of unknown impurities are invoked to explain the observed differences. F. A. B.

HIBBEN (James H.). *The reemission of visible light and the coloration by ultraviolet light of certain crystals*. Physical Rev. (Amer. Phys. Soc.), 1937, vol. 51, p. 530, 1 fig.

Some large crystals of MgO irradiated by ultra-violet light, especially 2536 Å., became deep purple. Removed from the radiation the color rapidly fades; complete decolorization takes several weeks, but is hastened by heat or exposure to violet light of wave-length 4358 Å. Other crystals of MgO do not show the effect, which is presumably due to electron exchange of impurities. L. J. S.

JONG (W. J.). *Luminescentie van mineralen in ultraviolet licht*. Geol. Tijdschr. & Mijnbouw, 1939, vol. 1, pp. 257-272. (Dutch with English summary.)

A review of the literature on the fluorescence of minerals in ultraviolet rays is followed by a list of species, arranged systematically from inorganic elements to organic, and stating localities, which show this effect. Several new observations being added. L. J. S.

[BONSHTEDT (E. M.)] Бонштедт (Э. М.). Некоторые результаты исследования минералов в ультрафиолетовом свете.—БОНШТЕДТ (E. M.). *Some results of examination of minerals in the ultra-violet light*. Изв. Акад. Наук СССР, Сер. Геол. (Bull. Acad. Sci. USSR, Sér. Géol.), 1939, no. 4, pp. 188-193. (Russian with English summary.)

Minerals from the Kola peninsula and other Russian localities were studied in ultra-violet light. This method made possible the discovery

the presence of certain minerals or alteration products. Some minerals, such as hackmanite, change their fluorescence colour on heating.

S. I. T.

HEIXNER (Heinz). *Fluoreszenzuntersuchungen an sekundären Uranmineralen*. Naturwiss., 1939, vol. 27, p. 454.

— *Fluoreszenzanalytische, optische und chemische Beobachtungen an Uranmineralen*. Chemie der Erde, 1940, vol. 12, pp. 433–450.

Among the secondary uranium minerals, the phosphates, arsenates, and sulphates fluoresce brilliant yellow-green, the carbonates weak pure green, the silicates do not fluoresce; but the presence of Cu, Bi, Pb, or Fe in the mineral inhibits fluorescence. Four 'autunite' specimens from Cornwall agree in optical properties with bassetite but do not fluoresce. A microchemical test of bassetite [one of these four specimens or another?] indicates absence of CaO and presence of Fe; bassetite is probably $\text{Fe}(\text{UO}_2)_2(\text{PO}_4)_2 \cdot 8(\text{or } 12)\text{H}_2\text{O}$. The 'autunite' of Hüttenberg, Pruthia, which does not fluoresce, contains U, As, and H_2O , and does not agree in optical properties with any known uranium mineral.

M. H. H.

FRATZSCH (František) & MALÝ (Jiří). *Luminiscence kostí a příbuzných neústrojných hmot v ultraviolovém světle*. [Luminescence of bones and related inorganic substances in ultra-violet light.] Anthropologie (Inst. Anthropol. Univ. Charles) Prague, 1933, vol. 11, pp. 227–231.

The fluorescence of bones depends on their age and on the treatment (with shellac, &c.) to which they have been subjected. Natural calcium phosphates were examined for comparison. Apatite from most pegmatites and cassiterite veins show a strong yellowish-brown or pinkish-brown fluorescence; other apatites a weaker one of dark red. Phosphorite (shark's teeth), fossilized coral, staffelite, and stercorite show a strong yellowish-brown, whilst amorphous collophane gave no distinct reaction.

F. S.

JENKINS (H. G.), McKEAG (A. H.), & ROOKSBY (H. P.). *Position occupied by the activator in impurity-activated phosphors*. Nature, London, 1939, vol. 143, p. 978, 1 fig.

Small but definite differences of lattice spacing exist between pure, non-fluorescent zinc silicate [willemite] and a manganese-bearing fluorescent variety, and between pure calcium tungstate [scheelite] and a barium-bearing variety, and indicate that the activator enters the lattice of the crystal.

M. H. H.

RANDALL (J. T.) & WILKINS (M. H. F.). *Luminescence and photoconductivity of solids*. Nature, London, 1939, vol. 143, pp. 978-979.

Uranyl salts, the tungstates of calcium, magnesium and zinc, rubies and many other fluorescent solids do not show photoconductivity and the decay of the phosphorescence follows an exponential law; hence the phosphorescence is due to electrons in excitation states. Willemite and blende are photoconducting and show thermoluminescence, and the phosphorescence is probably due to dissociated electrons. M. H. H.

PRZIBRAM (Karl). *Über die Fluoreszenz der zweiwertigen seltenen Erden. Nachtrag zu der Arbeit: „Verfärbung und Lumineszenz durch Becquerel-Strahlen. IV.“* Zeits. Physik, 1937, vol. 107, pp. 709-711.

Notes on fluorescence due to small amounts of certain rare-earth elements. The fluorescence bands of Eu, Sm, Yb, and Tm [- Tu] are all assigned to the divalent ions. M. H. H.

CHATTERJEE (Narayanchandra). *Über die Fluoreszenzspektren der seltenen Erden in künstlichen Fluoriten und deren Deutung*. Zeits. Physik, 1939, vol. 113, pp. 96-114, 8 figs.

The fluorescence spectra of artificial CaF_2 preparations containing Sm, Eu, Tb, Dy, and Er, and of YtF_3 containing Eu, have been studied. The origin of the various terms is discussed. M. H. H.

HABERLANDT (H.) & KÖHLER (A.). *Über die blaue Fluoreszenz von natürlichen Silikaten im ultravioletten Lichte und über synthetische Versuche an Silikatschmelzen mit eingebautem zweiwertigem Europium*. Naturwiss., 1939, vol. 27, p. 275.

Many natural feldspars and datolites fluoresce blue owing to the presence of traces of europium in the divalent state: fusion in a reducing atmosphere often intensifies the fluorescence by reduction of trivalent europium also present. By comparison with synthetic preparations, the europium content of a natural mineral may be estimated over the range 10^{-2} - 10^{-7} % EuO; this has been done for numerous feldspars, and certain regularities are noted, e.g. the potash-feldspars of hydrothermal or pegmatitic origin contain little or no EuO, which is most characteristic of granites and syenites. M. H. H.

ECKSTEIN (H. Ph.). *Distribution of fluorescence excitation of bivalent europium in calcium fluoride and of bivalent samarium in calcium sulphate*. Nature, London, 1938, vol. 142, pp. 256-257.

ECKSTEIN (Herbert P.). Ditto. Ibid., 1939, vol. 143, p. 1067, 1 fig.

The blue fluorescence of CaF_2 or NaCl containing traces of Eu, after

radiation with Ra, is most strongly excited by light of λ 2300–2400, 2800, 3500, and 3850 Å.; that of natural Weardale fluorite by the same wave-lengths except the last, and by 4000 Å. Calcium sulphate containing Sm, after irradiation with Ra, is most strongly excited by light of λ 2400, 3500, 3700, and 4000 Å. The radium treatment appears to reduce Eu_2O_3 or Sm_2O_3 to EuO or SmO and may be replaced by prolonged irradiation with light of λ 2400. M. H. H.

WILES (J.) & MARTIN (W. E.). *Note on the luminescence of wetted solids.* Proc. Leeds Phil. Lit. Soc., Sci. Sect., 1939, vol. 3, pp. 557–558, 1 pl. A wide range of white solids—cellulose, CaCO_3 , CaF_2 , SiO_2 , alkali halides—when wetted with water and exposed to ultra-violet light give phosphorescence which may last several minutes; the spectrum of the phosphorescent light is independent of the solid. Heating at as low a temperature as 150° C. slowly destroys the power of luminescence, but high vacua in the cold do not; it is restored by recrystallization and not by exposure to air. The luminescence is attributed to water sorbed on internal cracks. Methyl alcohol, but not ethyl, is also effective in producing luminescence. M. H. H.

Growth and Corrosion of Crystals.

KLEY (H. E.). *Some problems connected with crystal-growth.* Mem. Manchester Lit. Phil. Soc., 1939, vol. 83 (for 1938–39), pp. 31–62, 4 figs.

A review of previous work [M.A. 4–351; 5–117, 260; 6–109, 270; 1930]. Pleochroism due to the orientation of included molecules of crystals is described. L. J. S.

FRANSKI (I. N.). *Ueber die Kristallwachstumstheorie und ueber die Moeglichkeit, die zwischen den Gitterbausteinen in homoeopolaren Kristallen wirksamen Kraefte auf Grund von Kristallwachstumsformen zu bestimmen.* Atti X Congr. Internaz. Chim., Roma, 1938, vol. 2, pp. 514–25, 2 figs.

A review of recent theories on the growth of crystals. [M.A. 5–110, 111; 6–114, 269.] L. J. S.

SCHMANN (Hans). *Die Morphologie der Anfangsstadien beim Wachstum von Steinsalzkuugeln.* Inaug.-Diss. Breslau, 1939, 99 pp., 12 pls.

A study of the early stages of growth on spheres of halite, giving volumetric measurements and photographs of the various areas. Compare A. Neuhaus [M.A. 4–173] and E. Ernst [M.A. 6–513]. L. J. S.

FINCH (G. I.) & WHITMORE (E. J.). *Crystal growth on calcite surface*. Trans. Faraday Soc., 1938, vol. 34, pp. 640-645, 2 pls.

Natural or artificial surfaces of calcite which give good electrodiffraction patterns with well-defined Kikuchi lines also give good orientation of NaNO_3 . Polished surfaces are amorphous and fail to orient NaNO_3 only if their direction is far removed from the cleavage and they readily crystallize when gently heated. Good polish could be obtained in all directions except near the (111) plane. The oriented NaNO_3 crystals are in all cases fully parallel to the calcite. M. H. H.

PATTON (Leroy T.). *A quantitative measurement of the natural rate of growth of calcite crystals in geodes*. Science, New York, 1939, vol. 89, p. 485.

In ten years, crystals of calcite up to 2.5×1.5 mm. have grown in cavities of cement pillars partly sheltered from rainfall and in a dry climate. M. H. H.

SAKUI (Seita). *The growth of magnesium crystal in its vapour*. See Papers Inst. Physical & Chem. Research, Tokyo, 1938, vol. 3, pp. 1131-1146, 13 figs.

The conditions for the growth of large magnesium crystals from the vapour phase are described. M. H. H.

HAWARD (R. N.). *The growth of crystals from a stream of vapour*. Trans. Faraday Soc., 1939, vol. 35, pp. 1401-1413, 8 figs.

Crystals of salicylic acid, mercuric iodide, anthracene, stannic iodide and iodine were grown in a vapour stream of known density. There are no signs of a constant condensation coefficient; the data indicate the presence of a thick, mobile, amorphous surface layer. In the case of salicylic acid, crystallization appears to involve a bimolecular process in agreement with the crystal-structure. M. H. H.

RICHARDS (William T.), KIRKPATRICK (Edward C.), & HUTZ (Carl E.). *Further observations concerning the crystallization of undercooled liquids*. Journ. Amer. Chem. Soc., 1936, vol. 58, pp. 2243-2248.

The crystallization of salol, benzophenone, and benzene is always heterogeneous in mechanism, and probably starts from the adsorption film on dust particles present. Two distinct types of crystallization centre appear to exist, the one responsible for 'overheatable nuclei', the other leading to crystallization at low temperatures. A possible explanation is discussed. M. H. H.

DORSEY (N. Ernest). *Supercooling and freezing of water*. Journ. Research U.S. Nat. Bur. Stand., 1938, vol. 20, pp. 799-808. (Research Paper 1105.)

Water sealed in glass bulbs can be supercooled very considerably, as low as -21°C ., and normally shows a definite freezing temperature, characteristic of the specimen, but altered by sedimentation or heating. The freezing-point is determined by the size and nature of suspended impurities. Supercooled water is not markedly sensitive to mechanical disturbance. M. H. H.

FRANKS (J. A.). *Amorphous antimony*. Nature, London, 1935, vol. 136, p. 299.

A film of antimony produced by distillation in a high vacuum, and shown by electron diffraction patterns to be amorphous, is essentially identical with explosive antimony. Measurements on the heat liberated during the crystallization of explosive antimony and of its diamagnetic susceptibility suggest that the explosive (amorphous) state of antimony is the supercooled liquid state. F. A. B.

FEHL (H.). *Experimentelle Untersuchungen über das Auftreten echter gekrümmter Kristallflächen bei Kristallisationen aus Lösungen*. Neues Jahrb. Min., 1936, Abt. A, Beil.-Bd. 71, pp. 121-162, 6 pls., 20 text-figs.

The growth of crystals of potassium acetone disulphonate, which readily develop curved faces, has been investigated in detail, but few general conclusions can be drawn from the results. Curved faces are regarded as economies of material, and generally seem to appear in place of a very slow growing face when this has very quick growing faces as neighbours, but this condition is not sufficient to determine their appearance. Curved faces are not smooth uniform curves, but are built up of a complex of hillocks. M. H. H.

GITTERINK (Merle D.) & FRANCE (Wesley G.). *Adsorption at crystal-solution interfaces. X. A study of the adsorption of monoazo dyes by crystals of potassium sulfate during their growth from solution*. Journ. Physical Chem., 1938, vol. 42, pp. 1079-1088, 3 figs.

The adsorption of a wide variety of dyes was studied in its relation to crystal habit; non-adsorbed dyes did not affect the crystal habit. Dye characteristic habit variations are correlated with general adsorption or adsorption on specific faces. Correlations of adsorption with the structure of the dye are also discussed. M. H. H.

COOPER (J. A.) & GARNER (W. E.). *The dehydration of crystals of chrome alum*. Proc. Roy. Soc. London, Ser. A, 1940, vol. 174, pp. 487-500. 1 pl., 9 text-figs.

Measurements were made of the rate of growth of spherulites of $K_2Cr_2(SO_4)_4 \cdot 12H_2O$ on the (111) faces of chrome-alum at different temperatures and vapour pressures, and of the heat adsorption. The action at the interface of the two solid phases is considered.

L. J. S.

Meteorites and Tektites.

HEY (MAX H.). *Second appendix to the catalogue of meteorites, with special reference to those represented in the collection of the British Museum (Natural History)*. London (British Museum), 1940. 136 pp. Price 5s.

G. T. Prior's Catalogue, 1923 [M.A. 2-97] with appendix, 1927 [M.A. 3-463] has become the standard work of reference on the individual falls of meteorites. The present appendix brings the list up to September 1939. The number of recorded falls progressively increases: in 1923, 850; in 1927, 992; and now 1251. The last of these totals does not include several doubtful meteorites and suggested identities. Much additional information is also given respecting earlier falls, with references to all the recent literature [M.A. 1-7]. A separate list summarizes the details of known meteorite craters.

L. J. S.

[ASTAPOVICH (I. S.) & FEDYNSKY (V. V.)] Астапович (И. С.) и Федынский (В. В.). Метеоры. [*Meteors*.] Moscow & Leningrad (Acad. Sci. USSR, Sci.-Popular series), 1940, 128 pp., 5 pls., 68 text-figs. Price 4 rub.

This booklet on the astronomical study of meteors by V. V. Fedynsky includes chapters on meteorites (22 pp.) and on meteoritic material in the universe (24 pp.) by I. S. Astapovich, giving velocity and times of fall, brief notes on the composition and structure of meteorites, of meteoritic showers and meteorite craters, &c.

L. J. S.

ASTAPOWITSCH (I. S.). *Results of the study of 66 orbits of meteorites*. Journ. Roy. Astron. Soc. Canada, 1939, vol. 33, pp. 305-308.

Chondrites (49) have elliptical or hyperbolic orbits coinciding with those of comets, whilst 7 eucrites, 5 irons, and 2 carbonaceous stones are from outside the solar system.

L. J. S.

LYLIE (C. C.). *Where do meteorites come from?* Science, New York, 1939, vol. 90, pp. 264-265.

The various suggestions considered are that meteorites have come from: (1) the distance of the fixed stars; (2) the outer limits of the solar system, like comets; (3) asteroids with orbits little larger than that of Mars. Calculations of the orbits of recent meteors and of the Pultusk (1668) meteorite show that they are near to those of the nearer asteroids.

L. J. S.

BETHANY (F. A.). *The age of meteorites.* Occasional Notes Roy. Astron. Soc., 1939, no. 5, pp. 57-64, 1 pl., 1 text-fig.

Previously published [M.A. 4-122, 428; 5-7] estimates of the ages (100-2800 million years) were based on the helium/uranium ratio. Determinations of thorium ($6-17 \times 10^{-8}$ g. per g.) have now also been taken into account. For the Bethany (Goamus farm) iron the age is now given as 30 million years (instead of 100), while for Bethany (Amalia farm) 1000 million years. [Not a very convincing result for two masses of the same fall.] Meteoritic stones lose nearly all their helium when heated to $300-800^{\circ}\text{C}$., while irons retain nearly all up to 1000° . The content of helium is slightly less in the external heating zone of irons than in the centre of the mass.

L. J. S.

ALLMAN] (P. M.). *The albedo of meteorites.* Journ. Roy. Astron. Soc. Canada, 1939, vol. 33, pp. 59-65, 1 fig.

A comparison of the reflecting power of meteorites [M.A. 7-172, 266] with the albedo of asteroids.

L. J. S.

MONARD (Frederick C.). *Recording and designating meteoritic falls: second note.* Popular Astronomy, Northfield, Minnesota, 1939, vol. 47, pp. 566-567. [M.A. 7-371.]

WININGER (H. H.). *Collecting meteoritic dust.* Scientific Monthly (Amer. Assoc. Adv. Sci.), 1940, vol. 50, pp. 460-461.

Dust collected by a magnet at the exit of rain-pipes from roofs contains numerous minute (0.09 mm. diam.) highly magnetic globules and give a positive reaction for nickel. The amount collected corresponds to several thousand grams per square mile annually.

L. J. S.

TONIADI (E. M.). *On ancient meteorites, and on the origin of the crescent and star emblem.* Journ. Roy. Astron. Soc. Canada, 1939, vol. 33, pp. 177-184, 2 pls.

Notes on meteorites from classical times shown in temples and on

coins. No connexion is suggested between meteorites and the crescent moon and star (Venus).

L. J. S.

FOSTER (Joseph F., Jr.). *The determination of meteorite densities*. Popular Astronomy, Northfield, Minnesota, 1940, vol. 48, pp. 262-265.

The following determinations were made: Holbrook (crusted stone 9.9 g.) 3.517; Holbrook (nine small, partly crusted stones) 3.460; Llano del Inca (crusted) 3.212; Toluca, 6.932; Admire (badly cracked) 3.747. Errors of determination and variations with the use of different immersion liquids are discussed.

L. J. S.

YOUNG (J.). *Crystallographic studies of meteoric iron*. Phil. Trans. Roy. Soc. London, Ser. A, 1939, vol. 238, pp. 393-421, 2 pls., 10 text-figs.

From Laue photographs obtained by back reflection from etched slices of the Canyon Diablo, Butler, and Carlton siderites and of a heat-treated nickel-iron alloy (Ni 10.5 %) the relative orientation of kamacite and taenite are determined [Min. Mag. 22-382; M.A. 3-259, 7-269, 372]. (110) of kamacite is parallel to (111) of taenite and the octahedral lamellar structure; and [001] of kamacite is inclined at 4.1° (3.4° in the artificial alloy) to $[\bar{1}10]$ of taenite. In these 24 alternative orientations there is approximate coincidence of the body-centred cubic lattice of α -kamacite and the face-centred cubic lattice of γ -taenite. Distortion of the structure by shearing and the mechanism of the γ - α transformation are discussed. The following lattice dimensions were determined

	Ni %.	Kamacite.	Taenite.
Canyon Diablo	(7.3)	2.8644	3.5829 Å.
Butler	(10)	2.8624	3.5791
„ (in plessite area)		2.8616	3.5739
Carlton	(12.8)	2.8638	3.5781
„ (in plessite area)		2.8624	3.5708

L. J. S.

OWEN (E. A.) & BURNS (B. D.). *X-ray study of some meteoric iron*. Phil. Mag. London, 1939, ser. 7, vol. 28, pp. 497-519, 3 pls., 1 text-fig.

An X-ray examination was made of 21 iron meteorites and of the metallic portion of three stony-irons. The kamacite of the hexahedrites, nickel-poor ataxite, and coarsest octahedrites gave a cell-side varying with the nickel-content and agreeing fairly well with a straight line relation from 2.8605 Å. for pure iron to 2.8628 Å. for 6.3 % Ni. In the octahedrites, in the stony-irons, and in the three nickel-rich ataxites

rep Springs, Cape of Good Hope, and Kokomo, the kamacite has a constant cell-side of 2.8628 Å., and presumably a constant composition. Specimens of Babb's Mill (probably Troost's Iron), of Klondike (from near the surface and from the interior of the mass), and San Cristobal (from near the surface) showed a distorted α -structure with no trace of γ -lattice (taenite), but taenite appeared on annealing at 250–350° C. A specimen from the interior of San Cristobal showed some taenite accompanying the martensite (distorted α -structure). Taenite could be detected in all the octahedrites, in the stony-irons, and in the first three nickel-rich ataxites, but the spacing could only be measured in the more nickel-rich specimens, and shows fairly wide variations (3.5768 to 3.834 Å.) having no relation to the nickel-content of the meteorite; these are interpreted as due to differences in the thermal history of the meteorites, which should affect the composition of the taenite far more than that of the kamacite; the meteorites appear to have reached an equilibrium state at temperatures ranging from about 300 to 400° C., and to have cooled from this temperature at a moderate rate, since the diffraction lines due to the taenite are not sharp. The effect of annealing at temperatures up to 500° C. on the structures was studied. [M.A. 7-268, 384.]

M. H. H.

OWEN (E. A.). *The structure of meteoritic iron*. Phil. Mag. London, 1940, vol. 29, pp. 553–567, 1 pl., 2 text-figs.

The new phase diagrams for the nickel-iron system obtained by Owen and Sully [M.A. 7-384] for equilibrium conditions and for quenched specimens lead to the conclusion that the commonly accepted view that the Widmanstetter pattern has arisen from segregation from very large grains during cooling cannot be upheld. It is suggested that a mass of iron in the gamma-phase [taenite] will on cooling transform into a finely granular metastable phase which has a distorted alpha-structure and to which the designation α_2 is given. If this mass is then annealed over long periods at temperatures below 580° C., a recrystallization will start at a limited number of centres forming the two stable components, kamacite and taenite (α and γ respectively) which will tend to grow in definite orientation to one another, to form large crystals. These will enclose small regions in which recrystallization is retarded later giving rise to a small-scale kamacite-taenite intergrowth, in regions which remain in the α_2 state. The term plessite is reserved for such of these small regions as have undergone transformation to kamacite + taenite, while for the granular, structureless form of plessite,

consisting of the α_2 phase, the new name 'metakamacite' is proposed. The theory readily explains the varying width of the kamacite bands, octahedrites and its approximate relation with the nickel-content and the variation in the composition of the taenite which should be richer in nickel where it is in contact with the kamacite. The nickel-rich ataxites examined proved to be mainly metakamacite. The reason for their failure to recrystallize is not clear, but it may be that the degree of instability of metakamacite varies with the nickel-content. [M. A. 7-268.] M. H. H.

DERGE (Gerhard). *The metallurgical interpretation of the structures found in meteoritic irons*. Popular Astronomy, Northfield, Minnesota, 1939, vol. 47, pp. 558-565, 6 figs.

A summary of previous work [M.A. 5-152; 7-63, 372]. Slip twinning in Fe-Si alloys and the production of pearlite and martensite in steels are considered. It is concluded that the lamellar octahedral structure of siderites resulted during very slow cooling from a high temperature. L. J. S.

NININGER (H. H.). *Diamonds in Canyon Diablo, Arizona, meteorite*. Popular Astronomy, Northfield, Minnesota, 1939, vol. 47, pp. 504-507, 3 figs.

In preparing a number of small slices of this siderite it was noticed that in about 20 cases the carborundum cloth was torn owing to the presence of minute specks of black diamond (carbonado). These are usually embedded in nodules or veins of dark sulphide or carbonaceous matter, or sometimes in schreibersite. In one case they were found in the carbonaceous zone lining a cavity in schreibersite. The presence of a cavity suggests that the diamond was not formed under great pressure. L. J. S.

KSANDA (C. J.) & HENDERSON (E. P.). *Identification of diamond in the Canyon Diablo iron*. Amer. Min., 1939, vol. 24, pp. 677-680, 2 figs.

From the cavity above mentioned (preceding abstract) fifty black grains (0.1-0.9 mm. across) were isolated. They are associated with graphitic material in a troilite area which is partly surrounded by schreibersite. They are not scratched by carbonado, and crushed fragments are transparent only at the edges; they are isotropic with n about 2.42 (yellow), and an X-ray powder photograph (a 3.55 μ) is identical with that of diamond. X-ray photographs of the graphitic material show the lines of graphite. L. J. S.

AWLEY (F. G.). *The occurrence of platinum in meteorites*. Popular Astronomy, Northfield, Minnesota, 1939, vol. 47, pp. 439-444.

Platinum (i.e. Pt metals) has been determined in 29 meteorites (4 siderites, 1 pallasite, and 9 stones) that have been analysed at various times by the author. In siderites the amount ranges from 2.0 to 6.9 parts per million, varying, with few exceptions, with the amount of nickel: those with about 16 % Ni average 119 p.p.m. (0.0119 % = $3\frac{1}{2}$ oz. per ton); those with 6-8 % Ni 14 p.p.m.; while others with little more than 1 % Ni contain 1.7 p.p.m. Iridium is always present (20-30 % of the whole in three determinations); and 10 tests for palladium gave positive results. Pt and Ni are associated together in basic igneous rocks; and in josephinite from Oregon 0.12 oz. per ton was found. Siderites were dissolved in H_2SO_4 , the residue filtered with Cu and Ag sulphides, and an assay made by the gravimetric method.

L. J. S.

EVANS (Robley D.), HASTINGS (Jane L.), & SCHUMB (Walter C.). *Radioactive determination of protactinium in siliceous terrestrial and meteoritic material*. Geol. Ser. Field Mus. Nat. Hist. Chicago, October 1939, vol. 7, no. 5, pp. 71-78.

SCHUMB (Walter C.), EVANS (Robley D.), & HASTINGS (Jane L.). *The radioactive determination of protactinium in siliceous terrestrial and meteoritic material*. Journ. Amer. Chem. Soc., December 1939, vol. 61, pp. 3451-3455.

Protactinium was isolated by co-precipitation with zirconium pyrophosphate and its amount determined with the recording alpha counter. Granite from Ontario contained Pa 0.46, Ra 0.28, and the Pultusk meteorite Pa 0.035, Ra 0.023×10^{-12} gram per gram. The ratio Pa/Ra, 1.52 in granite and 1.52 in the meteorite, indicate, within the limits of error, that the age of the uranium atoms is the same in both materials.

L. J. S.

EVANS (Hans). *Die Radioaktivität des Kaliums als Mittel zur Bestimmung des relativen Alters der Elemente in Meteoriten*. Naturwiss., 1939, vol. 27, pp. 702-704, 1 fig.

The age of terrestrial elements is defined as the period since when an alteration of their present abundance and isotopic composition has not taken place and is about 4.6 to 5×10^9 years. The radioactivity of potassium from different sources should allow a comparison of the age of the element from the different sources. Since the majority of meteorites originate outside the solar system [this assumption is by no

means proven], a comparison of the radioactivity of meteoritic a terrestrial potassium is a comparison of the age of the terrestr elements and those of the galactic system. For three meteorites a four tektites no difference in the activity could be found. [M.A. 7-27

M. H. H.

CORLIN (Axel). *Meteorite falls and bright fireballs observed in Sweden the last twenty years*. Popular Astronomy, Northfield, Minnesota 1939, vol. 47, pp. 436-439, 2 figs.

— *A preliminary report on fireballs observed in southern Sweden May 27, 1938*. Ibid., 1939, vol. 47, pp. 525-537, 5 figs.

A figure is given of the Hedeskoga meteoritic stone which fell April 20, 1922 [M.A. 3-93]. A stone, weighing 3.31 kg., was heard (n seen) to fall at Ekeby in western Skåne at 6 h. 12 m. G.M.T. on April 1939, making a hole 35 cm. deep in loose ground. It has the form of triangular prism with seven fractured surfaces of different times formation during flight. A small fragment that fell separately 8 metr away fits perfectly to the last-formed surface. It is a chondrite with olivin

On February 12, 1922, a meteorite was seen to fall on a frozen la at Skåne-Tranås in Skåne, making an elliptical hole 20×18 cm. in t ice, but, although the lake was drained, nothing was recovered. (September 22, 1936, at 17 h. 21.5 m. G.M.T. a meteor with heliocentr velocity 41 km. per sec. exploded at a height of 20 ± 3 km. Fragmen probably fell in the forests around Loos, but none was found. (May 27, 1938, at 18-20 h. G.M.T. a swarm of bright fireballs was se over southern Sweden; and a bright fireball was seen in the same regio in the evening of May 26, 1939.

L. J. S.

GALLITELLI (Paolo). *Sulla meteorite caduta in Albareto di Modena i luglio 1766*. Periodico Min. Roma, 1939, vol. 10, pp. 345-373, 3 pls.

The Albareto meteorite fell near Modena in July 1766 and w described in that year by D. Troili. In it W. Haidinger in 1863 reco nized a constituent to which he gave the name of troilite. Fragmen still preserved in various collections suggest that the original weig was at least $1\frac{1}{2}$ -2 kg. Spherical chondrules of enstatite and of olivine a present in a granular groundmass of olivine, enstatite (2V about 80° diopside or clinoenstatite (with polysynthetic twinning, $\gamma : c = 19-22^\circ$ felspar (andesine and labradorite), and basic glass (n 1.530-1.546), wi nickel-iron, troilite, and limonite stains. Analyses of the magnetic ar

non-magnetic portions give the bulk composition: SiO_2 40.38, TiO_2 trace, Al_2O_3 3.22, Cr_2O_3 0.28, Fe_2O_3 2.14, FeO 18.88, NiO 0.09, MnO 0.14, MgO 24.88, CaO 2.60, Na_2O 1.23, K_2O 0.30, $\text{H}_2\text{O} +$ 0.28, P_2O_5 trace, 22.17, C trace, Fe 4.07, Ni 0.67, Co 0.005, total (less O for S) 100.29, corresponding with olivine 51.93, pyroxenes 20.75, feldspars 14.12, spinel 5.67, nickel-iron 4.65'. Spectroscopic analysis shows the presence also of Ba, Sr, Cu, Li, Pb, V, Zn, Sb. With Fe/Ni 5.3 and MgO/FeO 3.0, the meteorite comes on the border of the Baroti and Soko-Banja groups.

L. J. S.

KRINOV (E. L.). *New findings of the Zhovtnevy meteorite*. Compt. Rend. (Doklady) Acad. Sci. URSS, 1939, vol. 24, pp. 280-281, 2 figs.

Two more stones (nos. 5 and 6) of the Zhovtnevy fall [M.A. 7-373] have been found at distances of 1-2 km. No. 5, the largest complete one (21,745 g.), was found in a pit 40 cm. deep in a ploughed field. No. 1, weighing 32 kg., was broken into many fragments. Thirteen fragments of no. 6 weigh 12,873 grams. The total weight of fragments of the six stones recovered is 65,893 grams. No doubt other stones still remain to be found.

L. J. S.

KRINOV (E. L.) КРИНОВ (Е. Л.). Новые метеориты СССР. [*New meteorites, USSR.*] Наука и Жизнь, Акад. Наук СССР [Science and Life, Acad. Sci. USSR], 1939, no. 4, pp. 20-24, 10 figs.

Accounts are given of the Lavrentievka (Лаврентьевка), Pavlodar (Павлодар), Kukshin (Кукшин), and Zhovtnevy (Жовтневый) meteorites [M.A. 7-270, 271]. Of Zhovtnevy ($47^\circ 35' \text{ N.}$, $37^\circ 15' \text{ E.}$) four large and several small fragments of total weight 27,843.66 grams were collected. Mention is made of four bolides seen in 1938.

S. I. T.

HAVERT (P. L.). *A new iron meteorite from Kazakhstan, U.S.S.R.* Journ. Roy. Astron. Soc. Canada, 1939, vol. 33, pp. 51-52.

Translation of the Russian paper on the Novorybinskoe meteorite. [M.A. 7-374.]

L. J. S.

HAVERT (P. L.). *Some lost meteorites of the U.S.S.R.* Journ. Roy. Astron. Soc. Canada, 1939, vol. 33, pp. 53-56.

Brief notes are given of twenty meteorites now lost, under dates 1635, 1634, 187?, 1881, and the others during the present century.

L. J. S.

ANN (J. A.). *The Rangala meteorite*. Rec. Geol. Surv. India, 1939, vol. 74, pp. 260-276, 5 pls., 1 text-fig.

At about 10 a.m. on December 29, 1937, a stone was heard to fall at

Rangala ($25^{\circ} 23' N.$, $72^{\circ} 1' E.$) in Rajputana, making a pit 1 foot deep and $1\frac{1}{2}$ feet across. The noise was also heard at Bhinmal, 30 miles to the SE. The stone is somewhat friable and was broken into fragments by its fall; 22 fragments with a total weight of $3224\frac{1}{2}$ grams have been recovered. It is a veined white chondrite, with only few chondrules, the largest 4 mm. across. Micro-sections of the crust show three zones: (1) black opaque slag, 0.2 mm. thick; (2) intermediate zone, 0.2 mm. thick, almost free from opaque material; and (3) inner zone, 0.6 mm. thick, heavily charged with opaque material as veinlets of troilite and iron. Metallographic descriptions are given of the opaque minerals: kamacite (in which no nickel could be detected by a micro-chemical test), taenite, troilite, chromite, and native copper (seen as two minute specks in an intergrowth of kamacite and taenite). Analyses by P. C. R. of the magnetic and non-magnetic portions gave the following bulk composition of the meteorite: Fe 8.26, Ni 1.00, Co 0.14, Fe (in troilite) 3.26, S 1.86, SiO_2 40.02, TiO_2 0.08, Al_2O_3 2.27, Cr_2O_3 0.29, Fe_2O_3 0.4, FeO 14.59, MnO 0.12, Cu trace, MgO 24.67, CaO 2.07, Na_2O 0.6, K_2O 0.14, P_2O_5 0.26, H_2O 0.03 = 100.16. This corresponds to feldspar 8.86, enstatite 35.27, olivine ($3Mg_2SiO_4 \cdot Fe_2SiO_4$) 39.32, troilite 5.45, nickel-iron (Fe : Ni = 8 : 1) 9.27 %, and is very close to the results for the Baroti meteorite. A detailed analysis of the crust shows very nearly the same composition, but with more Fe_2O_3 (2.44 %). The formation of the crust and of veins in the crust and in the meteorite is discussed.

L. J. S.

CASSIRER (F. W.). *The Tamentit, Tuat, Morocco, meteorite*. Publ. Astron. Soc. Pacific, 1940, vol. 52, pp. 13-16.

This mass of 510 kg. was seen in 1864 at the mosque in the village of Tamenti, where, according to legend, it had been transported in the fourteenth century as a holy relic. It was described by A. Lacroix in 1927 [M.A. 3-393] and the present note reviews the information then given. A portion of the material was detached with a welding flame; this heating (1580°) had no effect on the octahedral structure, even at the surface; and the formation of globules of iron oxide suggests an analogy with chondrules.

L. J. S.

LA PAZ (Lincoln). *The distribution of the recognized meteorites of North America*. Popular Astronomy, Northfield, Minnesota, 1940, vol. 48, pp. 157-165, 2 figs. [M.A. 7-267.]

A mathematical discussion of the probability of a random distribution. The large number of finds in the southern Appalachians were made

uring placer mining for gold; and in the northern states and Canada
d earth surfaces were removed during the glacial period. [M.A. 6-10.]

L. J. S.

OLGROVE (W. G.). *The Dresden meteorite*. Journ. Roy. Astron. Soc.
Canada, 1939, vol. 33, pp. 301-303, 1 pl.

LEVA (E. G.) & COLGROVE (W. G.). *Committee's report on Dresden
meteorite*. Ibid., pp. 303-305.

ILLMAN (Peter M.). *The Dresden meteorite*. The Sky, Amer. Mus. Nat.
Hist., 1939, vol. 3, no. 11, p. 27.

A brilliant fireball was seen at 8.56 p.m. on July 11, 1939, over the
northern United States and southern Canada, and a meteorite was seen
fall six miles from Dresden, [Kent Co.], Ontario. It made a hole
 6×12 inches and over 7 feet deep, scattering clods of earth 30-40 feet.
weighs 88 lb. and is a grey chondrite.

L. J. S.

ERRY (Stuart H.). *The Helt Township (Indiana) meteorite*. Smithsonian
Miscell. Coll. 1939, vol. 98, no. 20, 7 pp., 9 pls.

A flake-shaped ($7 \times 6 \times 1\frac{1}{2}$ cm.) siderite weighing 218½ grams, found
an old collection, is said to have been seen to fall in Helt township,
million Co., about 1883 or 1884. It is a coarsest octahedrite con-
ting almost entirely of kamacite with little plessite and taenite and
erous schreibersite inclusions. The structure is well illustrated by
gh-magnification photographs.

L. J. S.

ONARD (Frederick C.). *Photographs of the Widmanstätten structure
of the Goose Lake, California, siderite*. Popular Astronomy, North-
field, Minnesota, 1939, vol. 47, pp. 507-508, 2 figs.

— *The Goose Lake siderite: the largest known meteorite from California*.
The Griffith Observer, Griffith Observatory, Los Angeles, California,
1940, vol. 4, no. 1, pp. 2-8, 6 figs.

NSLEY (Earle G.). *The giant Goose Lake meteorite from Modoc County,
California*. California Journ. Mines & Geol., 1939, vol. 35, pp. 308-
312, 3 figs.

(1) Two photographs, taken in different inclinations of the light, of a
ball etched slice show the structure of a medium to coarse octahedrite.

(2) and (3) Further details are given of the discovery and removal
the mass. A map shows the location of the ten meteorites known
om California. [M.A. 7-379.]

L. J. S.

PRUETT (J. Hugh). *The Washougal, Washington, aërolite*. *Popular Astronomy*, Northfield, Minnesota, 1939, vol. 47, pp. 500–502, 2 figs.

NININGER (H. H.). *Note on the Washougal, Washington, aërolite*. *Ibid.* pp. 503–504.

A stone, weighing 220 grams, was found on July 3, 1939, 1 mile north of Washougal, Clark Co., and is supposed to be connected with the meteor seen the day before over Portland, Oregon (20 miles to the west). It is a howardite with glazed black crust, consisting inside of light gray fragmentary material with yellowish-green olivine. This is the first meteorite to be recorded from the State of Washington. L. J. S.

BULLARD (Fred M.). *The Bartlett meteorite, Bell County, Texas*. *Amer. Min.*, 1939, vol. 24, no. 12, pt. 2, p. 4; 1940, vol. 25, p. 205 (abstract).

A medium octahedrite weighing 8.59 kg. was ploughed up about 1935 at 5 miles W. of Bartlett in Bell Co. It contains Fe 90.41, Ni 8.8, Co, P, Cu, Si, Ge. L. J. S.

NININGER (H. H.). *New light on the Glorietta [sic], New Mexico, meteorite*. *Amer. Journ. Sci.*, 1940, vol. 238, pp. 56–62, 1 pl.

Since the first find in 1884 of meteoritic iron on Glorietta Mountain, Santa Fe Co., several other masses have been found in the neighborhood. Some of these show included nests of olivine, and the meteorite is described as a 'combination siderite and pallasite'. Pojoaque [M.A. 5–12, 405] and Santa Fe [M.A. 6–14] are considered to belong to this fall. L. J. S.

PRUETT (J. H.). *The lost Port Orford meteorite*. *The Sky*, *Amer. M. Nat. Hist.*, 1939, vol. 3, no. 11, pp. 18–19, 22, 2 figs.

Unsuccessful efforts have been made to locate the large pallasite (estimated at 10,000 kg.) which was seen in 1859 'about 40 miles' from Port Orford in SW. Oregon, and of which only a few small fragments have been preserved in collections. L. J. S.

HERRERO DUCLOUX (Enrique) & LOYARTE (Ramón G.). *Nota sobre el hierro meteórico de Agua Blanca*. *Notas del Museo de La Plata*, 1939, vol. 4 (geol. no. 8), pp. 339–351, 8 figs.

A mass (49 kg.) of iron was found [date not stated] by a prospector in the hills at Agua Blanca, near Pinchas, in dep. Castro Barrios [28° 55' S., 66° 57' W.]. It is a medium octahedrite with kamacite bands 0.5–1 mm. wide, taenite, some plessite, and little troilite. Microchemical analyses gave the following results (those in brackets on

piece showing more plessite and no troilite nodules): Fe 95.354 (92.220), Ni 4.512 (7.420), Co 0.189 (0.378), Mn 0.006 (0.007), Sn 0.032 (0.032), Cu, Cr, Mo traces (traces), S 0.015 (0.012), P 0.216 (0.219), siliceous residue 0.034 (0.048), graphitic carbon 0.032 (0.021), sp. gr. 7.660 (7.860). The insoluble residue consisted of fragments of olivine crystals and scales and grains of graphite. Spectroscopic analysis showed the presence of the elements listed above except Mn. L. J. S.

FERRERO DUCLOUX (Enrique). *Nota sobre el meteorito de Águila Blanca (provincia de Córdoba)*. Notas del Museo de La Plata, 1939, vol. 4 (geol. no. 9), pp. 353-360, 5 figs.

A fireball was seen and three explosions heard at 20 h. on January 15, 1920, at Águila Blanca, a spring on the bank of the Rio Dolores, west of Capilla del Monte, in dep. Punilla [$30^{\circ} 52' S.$, $64^{\circ} 33' W.$]. Two stones were collected, but only one (1440 g.) was preserved and this is now in the La Plata museum. It is a whitish-grey chondrite with chondrules of olivine and enstatite. Sp. gr. 3.531. Analysis gave SiO_2 39.215, FeO_2 trace, Al_2O_3 3.214, Cr_2O_3 0.610, Fe_2O_3 trace, FeO 10.319, NiO 1.900, MnO trace, MgO 22.611, CaO 1.724, Na_2O 1.386, K_2O 0.213, SO_3 0.213, SO_3 trace, S 1.064, P 0.035, Fe 15.576, Ni 1.985, Co 0.034, Mn 0.011, corresponding to feldspars 14.586, pyroxenes 25.828, olivine 1.432, chromite 0.896, apatite 0.465, troilite 2.904, nickel-iron 15.711, schreibersite 0.532. L. J. S.

ENDERSON (E. P.). *Chemical studies of hexahedrite meteorites from Chile*. Amer. Min., 1938, vol. 23, no. 12, pt. 2, p. 8; 1939, vol. 24, p. 187 (abstract).

New analyses (data not given in the abstract) of five recently acquired hexahedrites (Puripica, Sierra Gorda, Rio Loa, Negrillos, and Coya Norte) show a remarkable agreement amongst themselves, suggesting that the masses may perhaps belong to one fall. But this agreement extends to hexahedrites from other regions and also with kamacite, indicating that meteorites of this class are composed entirely of kamacite. L. J. S.

ALOPIN (Raymond). *Etude d'une météorite nouvelle, trouvée à Union (Chili)*. Verh. Schweiz. Naturfor. Gesell., 1937, pp. 134-135.

Preliminary note of a paper published later. [M.A. 7-70.] L. J. S.

GREEN (V. B.). *Santa Luzia de Goyaz meteorite*. Amer. Min., 1939, vol. 24, pp. 598-601, 2 figs.

Of this siderite [M.A. 5-15, 152, 406; 6-205], found in 1927, six

pieces are known with a total weight of 1923 kg., the largest 1890 kg. It is a coarsest octahedrite. Etched sections show roughly rectangular (3.5×1 cm.) and circular areas (3.5 cm. diam.) of kamacite, the latter with cores of schreibersite and troilite. There is a little taenite and traces of plessite. Analysis I of the average kamacite and taenite masses and II of the separated kamacite (containing a little schreibersite).

		Fe.	Ni.	Co.	Cu.	Pt, &c.	P.	S.	C.	Total.
I	...	92.81	6.48	0.348	0.043	0.023	0.325	0.004	0.014	100.05
II	...	93.88	6.14	0.096	0.079	0.023	0.240	trace	0.006	100.40

L. J. S.

REINWALD (I. A.). *The Kaalijärvi meteor craters (Estonia): supplementary research of 1937; discovery of meteoric iron*. Tartu Ülikooli juurest oleva Loodusuuriate Seltsi Aruanded, 1939, vol. 45 (for 1938) pp. 1-19, 10 pls., 2 text-figs. Separate as Publ. Geol. Inst. Univ. Tartu, 1939, no. 55.

A detailed account is given of the new excavations in craters nos. 4 and 5 which resulted in the discovery of small fragments of meteoritic iron. [M.A. 5-17, 301; 7-73, 274; Min. Mag. 25-75.] L. J. S.

RAYNER (J. M.). *The Henbury meteorite craters and geophysical prospecting*. Australian Journ. Sci., 1938, vol. 1, pp. 93-94.

— *Examination of the Henbury meteorite craters by the methods of applied geophysics*. Rep. Australian and New Zealand Assoc. Adv. Sci. 1939, vol. 24, pp. 72-78, 2 figs.

A large number of observations made by J. Daly in 1937 around the craters with vertical and horizontal magnetometers showed only small local magnetic anomalies ($<40\gamma$), no doubt due to small fragments of iron at shallow depths. There were no indications of any large masses. The craters are evidently explosion craters, the meteorites forming the rim being shattered and scattered as fragments. Two pieces (39 lb. and <1 lb.) of iron were collected. The iron has a magnetic susceptibility of 0.548. L. J. S.

ADDEY (F.). *Fall of supposed meteorite near Ardglass, Co. Down. Ireland*. Nat. Journ., 1938, vol. 7, pp. 34-36, 1 pl., 1 text-fig.

Near Ardglass, on December 6, 1937, at 4.30 p.m., a large fireball was seen to fall with a loud noise, breaking a tree and crushing the soil. At the same time a second one fell between tide-marks on the river Quoile, 6 miles to the NNW., making a large crater in the mud. No meteoritic fragments were found, and it is suggested that the effects were due to globular

lightning, since there were thunder-storms in the district and the electric light was affected; but it is remarkable that both falls should have occurred at the same time.

L. J. S.

BERNGES (Rudolf). *Das Nauheimer Meteoreisen*. Wetterauische Gesell.

Hanau, 1935, reprint 4 pp., 3 figs.

A mass of iron weighing several pounds was found in 1826 at a depth of 5 feet in clayey gravel at Nauheim, Hesse, and was described in 1828 as meteoritic, but later classed as a pseudo-meteorite. A third fragment (4 g.) of this material has now been found in the collection of the Wetterau Gesellschaft. Analysis of the magnetic portion of this gave Fe 98, Ni 0.01, Co trace?, Mn 0.15, C 0.01, insol. (Fe_2O_3) 1.5. An etched section shows an outer zone of black slag, then a zone of granular ferrite, and in the middle a mixture of metal and oxide. It is suggested that the carbon is too low for a manufactured iron of the period when the mass was found. [But the description now given confirms the pseudo-meteoritic character of the material.]

L. J. S.

CARTLAM (E. R.). *A meteoritic hypothesis of the origin of continents*.

Popular Astronomy, Northfield, Minnesota, 1938, vol. 46, pp. 481-496, 8 figs.

Speculations on the breaking up of a thin primeval crust of a consolidating globe by the bombardment of meteorites.

L. J. S.

REUS (W. Carl). *An astronomical theory of tektites*. Popular Astronomy, Northfield, Minnesota, 1940, vol. 48, pp. 49-51. Supplement, *ibid.*, pp. 92-93.

The material of tektites is supposed to be the glassy basalt or tachylyte (basic, not an acid, rock!) of the deeper crustal layer of the earth, which was torn from the Pacific basin at the time of the fissional separation of the moon. Swarms of tiny satellites revolved round the earth within the Roche limit (as the rings of Saturn), and owing to cumulative perturbations caused by retardation by the moon these fell to earth at widely separated geological periods.

L. J. S.

DEK (D. van). *The tektites of Coco Grove*. [Marsman Mag. Manila (Marsman Trading Co.), 1939, vol. 4, no. 2, pp. 10-12, 3 figs.]

Abstract in Neues Jahrb. Min., 1940, Ref. I, pp. 51-52.

Tektites are found in the gold washings at Coco Grove, prov. Camarines Norte, Luzon. A hollow specimen dredged from a depth of 50 feet obliterated on exposure.

L. J. S.

BEYER (H. Otley). *Philippine tektites and the tektite problem in general*

Popular Astronomy, Northfield, Minnesota, 1940, vol. 48, pp. 43-48

Tektites are more abundant in the Philippine Islands than in other regions [M.A. 4-422; 5-18, 160; 6-403; 7-275]. They are of the rizalite and indo-malaysianite types. The largest known complete and unbroken tektite is a sphere weighing 1070 grams from the Paracale district, SE. Luzon. Tektites belong to four main geological periods: (1) Mesozoic in the Ivory Coast; (2) mid-Miocene, moldavites; (3) mid-Pleistocene indo-malaysianites; (4) post-Pleistocene or recent, australites. Indo-malaysianites are divided into the following groups according to the degree of viscosity of their material: (a) indochinites, the most viscous, as elongated drops; (b) rizalites, of intermediate viscosity, pitted spheroids, ellipsoids, and cylindrical forms; (c) billitonites and malaysianites, of medium viscosity, deeply etched spheroids and cylinders; (d) Java, the least viscous, with complex flow-lines. Theories of the origin of tektites for favourable consideration are: (1) volcanic or other terrestrial origin; (2) burning light-metal meteorites; (3) meteorite explosion-craters.

L. J. S.

Topographical Mineralogy.

TRAILL (J. G.). *The geology and development of Mill Close mine, Derbyshire*

Econ. Geol., 1939, vol. 34, pp. 851-889, 11 figs.

Lead and zinc ores occur in veins, flats, pipes, and caverns in the Carboniferous Limestone beneath a covering of shales and lavas. Primary minerals are galena (with Ag only 1-1½ oz. per ton), blende (Cd 1%), calcite (large scalenohedra), fluorite, baryte, and pyrite. Secondary minerals are hemimorphite, cerussite, greenockite (bright yellow encrustations), dundasite [Min. Mag. 16-272], hydrozincite, and aurichalcite.

L. J. S.

LANDERO (Carlos F. de). *Nota sobre los minerales primeramente descubiertos en México.* Mem. Acad. Antonio Alzate, Mexico, 1939

vol. 54, pp. 385-399.

Historical notes on 38 mineral species (vanadinite, cristobalite, native selenium, iodyrite, &c.) which were discovered and first described from Mexico, from the time of A. M. del Río (1764-1849).

L. J. S.

BÉTHUNE (Pierre de). *Découverte de célestine, à Rochefort.* Bull. Soc.

Belge Géol., 1940, vol. 49 (for 1939), pp. 128-131, 2 figs.

Pale blue crystals of celestine in geodes in Devonian limestone show

ae forms *o m d z a c* [Dana's letters]; sp. gr. 3.92, α 1.622, β 1.624, γ 1.631, $2V$ $50\frac{1}{2}^\circ$.
L. J. S.

POSEDKO (A. F.). *New data on the mineralogy of the Ilmen mountains*.
Compt. Rend. (Doklady) Acad. Sci. URSS, 1939, vol. 22, pp. 596–598.

Ilmenorutile intergrown with ilmenite is found in nepheline-pegmatite in the Ilmen mountains, Urals. Ilmenorutile can be distinguished from ilmenite by the greyish-green streak, greyish colour of powder, insolubility in hydrochloric acid, non-magnetic properties, and the absence of weathering films.
S. I. T.

MURDOCH (Joseph) & WEBB (Robert W.). *Notes on some minerals from southern California*. Amer. Min., 1938, vol. 23, pp. 349–355, map.

A short description of some mineral occurrences in southern California. (1) Okenite, grossular, and hyalite, Crestmore, Riverside Co. The forms of okenite pseudomorphs have been determined and found to correspond to wilkeite as previously described. (2) Almandine, San Gabriel Mts., Los Angeles Co.; large crystals from biotite-chlorite-schist. (3) Heulandite and stilbite in basalt, Acton, Los Angeles Co. (4) Gibbsite, San Joaquin valley, Kern Co. This is the first recorded occurrence of gibbsite in California and is found as pink to rose-red masses associated with chert in boulders. It has not yet been observed in situ. (5) Gastalite, Rincon, San Diego Co. at the contact of a small pegmatite dike with diorite. (6) Mariposite and clinozoisite, San Francisquito Canyon, Los Angeles Co. Mariposite occurs as emerald- to yellow-green flakes of 1–12 mm. diameter in schists, and the clinozoisite in a quartz vein. (7) Lamellar quartz, Twenty-nine Palms, San Bernardino Co.; shows signs of parting in three directions, one of which is almost perfect. The structure is thought to be due to replacement of the lamellae of a triclinic feldspar by single quartz crystals.
J. M. S.

MURDOCH (Joseph). *Some garnet crystals from California*. Journ. Geol., Chicago, 1939, vol. 47, pp. 189–197, 3 figs.

Large crystals of almandine occur in boulders of banded diorite in the southern part of San Joaquin valley, Kern Co., California. The dominant crystal form is the trapezohedron n (211) and inclusions of feldspar and magnetite are common. Carefully separated material was

tested chemically and found to be an iron-rich almandine with density 3.80 and refractive index $1.76 \pm$. The mode of origin is discussed.

J. M. S.

ULKE (Titus). *Additions to the minerals of the District of Columbia and vicinity*. Rocks and Minerals, Peekskill, N.Y., 1940, vol. 15, p. 81.

An addition to the list of minerals from the neighbourhood of Washington, D.C., already described [M.A. 6-362] bringing the total number of species and varieties up to 93 and 47 respectively.

J. M. S.

TRAINER (John N.). *Tilly Foster up-to-date*. Rocks and Minerals, Peekskill, N.Y., 1938, vol. 13, pp. 291-303, 3 figs.; 1939, vol. 14, pp. 50-52.

— *Another year at Tilly Foster*. Ibid., 1940, vol. 15, pp. 126-128, 4 figs.

A list of 59 mineral species, 19 varieties, and 32 pseudomorphs from the Tilly Foster mine, Brewster, New York, of which 19 species, 17 varieties, and 15 pseudomorphs have not previously been recorded from the locality. The finest specimens were obtained during the last century when the mine was working, but patient searching over dump-heaps by the author during recent years has brought to light many new finds.

J. M. S.

SACHS (Walter P.). *The story of the Great Notch quarry*. Rocks and Minerals, Peekskill, N.Y., 1940, vol. 15, pp. 111-115, 1 fig.

An account of the history of the Great Notch trap-rock quarries in New Jersey, together with a descriptive list of the zeolites and other minerals found there.

J. M. S.

PALMER (Ernest J.). *The mines and minerals of the Tri-State district*. Rocks and Minerals, Peekskill, N.Y., 1939, vol. 14, pp. 35-49, 4 figs.

An account of the history and working of the Tri-State (Missouri, Kansas, and Oklahoma) lead and zinc mining district. The mines produce high-grade lead and zinc ores and many fine, well-crystallized mineral specimens of which descriptions are given.

J. M. S.

TOKODY (L.). *Calcite and barite from Persberg*. Geol. För. Förh. Stockholm, 1940, vol. 62, pp. 22-30, 2 figs.

English translation of the Hungarian paper [M.A. 7-362]. A note by Nils H. Magnusson suggests that the mineral association is foreign to Persberg and that the material probably comes from Pajsberg or Långban.

J. M. S.

ORIN (R.). *Notes on a chrome amphibole from Turkey*. Geol. För. Förh. Stockholm, 1940, vol. 62, pp. 98-99.

Chemical and optical data are given for a chrome-amphibole from one of the Turkish chromite mines (probably near Smyrna). α 1.630, 1.650, $\gamma : c = 21^\circ$, $2V$ about 90° , SiO_2 46.55, TiO_2 0.15, Al_2O_3 7.44, Fe_2O_3 4.68, FeO 1.01, MgO 21.68, CaO 12.72, Na_2O 2.34, H_2O 1.77, total 99.87. The mineral is grass-green, occurs mixed with chromite, and frequently has inclusions of uvarovite (?). J. M. S.

EGELLELLI (V.) & CHAUDET (A.). *La hübnerita de la mina "San Vicente"*, Santa Rosa, San Luis. Rev. Minera, Soc. Argentina Minera Geol., 1939, vol. 10, pp. 74-77.

Hübnerite (WO_3 73.60, FeO 2.03, MnO 22.95, CaO 0.47, SiO_2 &c. 5.55 %, sp. gr. 6.66) occurs at the above mine, with pyrite, chalcopyrite, mala, limonite, malachite, rarely fluorite. M. H. H.

ETTL (Erwin). *Nuevos hallazgos de minerales en la República*. Rev. Minera, Soc. Argentina Minera Geol., 1939, vol. 10, pp. 78-81.

Ferritungstite (sp. gr. 5.57) occurs as pseudomorphs after wolframite in the quartz veins in granite of the Cerro Liquinaste, Sierra de Aguilar, Uruguay. Hyalite occurs, with chlorite, kaolin, and limonite, in a quartzite conglomerate at Los Pinos, Balcarce, Buenos Aires. M. H. H.

ERSONS (A. L.). *Magnesiochromite from Caribou pit, Coleraine township, Quebec*. Univ. Toronto Studies, Geol. Ser., 1939, no. 42, pp. 75-78.

Analysis by E. B. Ellestad of isotropic coffee-brown grains gave Al_2O_3 14.03, Cr_2O_3 55.51, Fe_2O_3 3.79, FeO 11.35, MnO 0.14, MgO 14.83, CaO 0.11, SiO_2 0.24, TiO_2 0.17, $\text{H}_2\text{O} +$ 0.07, $\text{H}_2\text{O} -$ 0.02 = 100.26. X-ray powder photographs showed the spinel structure with a 8.247 Å. Other analyses of Quebec chromites also show the presence of about 2 % MgCr_2O_4 . L. J. S.

IRRELL (Cordell) & MACDONALD (Gordon A.). *Chlorite veins in serpentine near Kings river, California*. Amer. Min., 1939, vol. 24, pp. 452-456.

Sills of hard, brittle serpentine are traversed by vertical veins, mostly from one to two inches thick, of chlorite composed of hexagonal plates of clinocllore up to 4 mm. across, twinned parallel to (001), α 1.581, 1.583, γ 1.588, $2V$ 5-20°, positive; analysis by W. H. Herdsman, SiO_2 31.04, Al_2O_3 18.77, Fe_2O_3 0.47, FeO 3.56, MgO 34.24, CaO nil, $\text{H}_2\text{O} +$ 10.40, $\text{H}_2\text{O} -$ 1.10, total 99.58. Most of the fine-grained chlorite in the veins is pennine, $\alpha < 1.574$, β and $\gamma > 1.576$, uniaxial, negative.

Less abundant is fine-grained pennine, α 1.578, γ 1.580, 2V 30–40° positive. An aluminous chlorite, not named, also occurs, with α 1.548, β and γ 1.565, uniaxial, negative. The origin of this occurrence of chlorite in serpentine is discussed.

F. A. B.

JARRELL (O. W.). *Marshite and other minerals from Chuquicamata, Chile*. Amer. Min., 1939, vol. 24, pp. 629–635, 5 figs.

Marshite intimately associated with atacamite yields Cu 33.0, I 66.67, Cl 0.33, total 100.01. Crystals several millimetres across and transparent and colourless to pale honey-coloured with adamantine lustre. On contact with humid air the colour darkens to salmon or red. The cubic crystal forms observed are (100), (111), (113), and (223) sp. gr. 5.68. Refractive indices were measured for various wave-lengths. The crystal form and optical properties are given also for olivenite, libethenite, darapskite, and wulfenite from the same locality.

F. A. B.

RICHMOND (Gerald M.). *Serendibite and associated minerals from the New City quarry, Riverside, California*. Amer. Min., 1939, vol. 24, pp. 725–726.

Serendibite, α 1.719, β 1.722, γ 1.724, 2V nearly 90°, positive, occurs as a massive granular aggregate in thin replacement bands in a contact of limestone with tonalite. A coarse aggregate of labradorite and hedenbergite occurs in the same quarry; the pyroxene is in part altered to greenish-yellow, earthy, fibrous nontronite, α 1.566, β 1.583, γ 1.583, 2V small and negative.

F. A. B.

MURDOCH (Joseph). *Miargyrite crystals from Randsburg, California*. Amer. Min., 1939, vol. 24, pp. 772–781, 2 figs.

Crystals of miargyrite, ranging in size from 1 mm. up to 1 cm. across, show forty-two forms, two of which are new, $T(313)$ and $\Sigma(322)$ (Dana axial ratios). Chemical analysis by F. A. Gonyer yielded S 21.5, Sb 41.73, Ag 36.57, Cu 0.07, Fe trace, total 99.91.

F. A. B.

Miscellaneous.

D'ANS (J.) & KÜHN (R.). *Getriebter Sylvin*. Kali, verwandte Salze und Erdöl, Halle, 1938, vol. 32, pp. 152–155, 4 figs.

A milky sylvine from Vienenburg, Hanover, owes its opacity not to gas or liquid inclusions, but to included minute crystals of halite arranged in parallel position to the sylvine.

M. H. H.

FRANCK (H. H.), BREDIG (M. A.), & FRANK (R.). *Untersuchungen über Kalk-Alkaliphosphate. I. Ein Beitrag zur Kenntnis des Rhenianaphosphates*. Zeits. Anorg. Chem., 1936, vol. 230, pp. 1-27, 8 figs.

A study of the system $\text{CaO-Na}_2\text{O-P}_2\text{O}_5$ revealed only one ternary compound, CaNaPO_4 , the X-ray powder photograph of which resembles that of K_2SO_4 . 'Rhenanite' (the principal component of certain phosphatic fertilizers) is a Ca-Na-carbonate-phosphate of variable composition, near $\text{Ca}_4\text{Na}_6(\text{PO}_4)_4\text{CO}_3$, but may also contain more or less SiO_2 . A partial study of equilibria in the system $\text{CaO-Na}_2\text{O-P}_2\text{O}_5\text{-CO}_2$ was made, and a Ca-Na-carbonate-apatite near $10\text{CaO} \cdot \text{Na}_2\text{O} \cdot 3\text{P}_2\text{O}_5 \cdot 2\text{CO}_2$ isolated. M. H. H.

FRANCK (H. H.). *Untersuchungen über Kalk-Alkali-Phosphate. II.* BREDIG (M.A.) & KANERT (E.). *Über Calcium-Kalium-Phosphate*. Zeits. Anorg. Chem., 1938, vol. 237, pp. 49-78, 7 figs.

The system $\text{CaO-K}_2\text{O-P}_2\text{O}_5$ has been studied over the range 600-1000° C. The ternary compounds found are CaKPO_4 , $\text{CaK}_2\text{P}_2\text{O}_7$, and $\text{Ca}_8\text{K}_2(\text{PO}_4)_6$, of which the last has the apatite structure, while the first is dimorphous with a transition point at 705° C. and can take up CaCO_3 and K_2CO_3 in solid solution. A compound $\text{Ca}_{11}(\text{PO}_4)_6(\text{CO}_3)_2$, with apatite structure, has also been isolated. The apatite-type structure of the compounds $\text{Ca}_8\text{K}_2(\text{PO}_4)_6$ and $\text{Pb}_3(\text{PO}_4)_2$ is remarkable and evidently determined by the stability of the $(\text{PO}_4)'''$ lattice, as they have vacant F positions [no evidence brought for this conclusion], while the apatite-type structure of $\text{Ca}_{11}(\text{PO}_4)_6(\text{CO}_3)_2$ remains unexplained. M. H. H.

FRANCK (H. H.) & DIHN (P.). *Über Kalk-Alkaliphosphate. Bemerkungen zu den gleichnamigen Arbeiten von H. H. Franck und Mitarbeitern*. Zeits. Anorg. Chem., 1938, vol. 240, pp. 40-49, 3 figs.

The compound $\text{Ca}_4\text{Na}_6(\text{PO}_4)_4\text{CO}_3$ is merely a mixture of CaNaPO_4 and Na_2CO_3 [but Na_2CO_3 lines were not recorded on the X-ray diagrams]. α - and β -potassium-rhenanites, CaKPO_4 , are identical. The 'potassium-apatite' $\text{Ca}_8\text{K}_2(\text{PO}_4)_6$ is a mixture of CaKPO_4 and $\beta\text{-Ca}_3(\text{PO}_4)_2$. The 'calcium carbonate-apatite' $\text{Ca}_{11}(\text{PO}_4)_6(\text{CO}_3)_2$ is doubtful, and may be a mixture of hydroxyapatite and CaCO_3 . M. H. H.

GRIGOROVICH (M.B.) Григорович (М. Б.). Условия залегания исландского шпата в Чалыкском месторождении (Северный Кавказ). [The mode of occurrence of Iceland spar in the Chalyk deposit (northern Caucasus).] Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1938, ser. 2, vol. 67, pp. 273-289, 1 pl., 1 text-fig.

Iceland-spar of commercial value is found in cavities and veins in a

metamorphosed limestone in the region of the river Chalyk in northern Caucasus. The mode of occurrence and the presence of chalcopyrite enclosed in calcite suggest that the deposit is of an epithermal origin. Several analyses of calcite, limestone, and gouge clay are given. S. I. T.

[SOLOVIEV (S. P.) & NIKOGOSYAN (K. S.)] Соловьев (С. П.) и Никогосян (Х. С.). Аномальные гранаты района Тырны-ауза и переход их в изотропное состояние при нагревании.—SOLOVIEV (S. P.) & NIKOGOSSIAN (Kh. S.). *Abnormal garnets of the Tyrny-auz (northern Caucasus) region and their transition to isotrope state at heating*. Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1938, ser. 2, vol. 67, pp. 651–654, 1 pl. (Russian with English summary.)

Some garnets from the skarn at Tyrny-Auz (northern Caucasus) were found to be anisotropic with $\gamma - \alpha$ 0.007–0.011. On heating they became isotropic at 750–850° C. An analysis of one of the garnets shows a type intermediate between andradite and grossular. S. I. T.

KASHKAI (Mir-Ali) Кашкай (Мир-Али). *Chemical-physical investigation of alunite from the Zaglik deposit (Transcaucasia)*. Compt. Rend. (Doklady) Acad. Sci. URSS, 1939, vol. 24, pp. 931–934, 3 figs.

Alunite and kaolinite are found associated with volcanic tuffs near Zaglik, Azerbaijan. The heating curves of alunite show endothermic reaction at 520° C. corresponding to the separation of water, and an endothermic reaction at 804–815° C. corresponding to the separation of SO_3 . Analyses of kaolinite, halloysite, aluminite, and alunite are given. S. I. T.

[SOLOVIEV (S. P.), GOLUBEV (N. A.), & ROZINA (B.)] Соловьев (С. П.), Голубев (Н. А.) и Розина (Б.). Первая находка минералов теллура на Кавказе.—SOLOVIEV (S. P.), GOLUBEV (N. A.) and ROZINA (B.) *The first discovery of tellurium minerals in the Caucasus*. Изв. Акад. Наук СССР, Сер. Геол. (Bull. Acad. Sci. URSS, Sér. Géol.), 1939, no. 5, pp. 168–171, 2 figs. (Russian with English summary.)

A silvery-white mineral found in a scree and probably derived from a contact metamorphic zone in the region of the river Baksan, northern Caucasus, gave on analysis Bi 92.80, Te 6.38, As 0.15, insoluble residue (Au) 0.15, Pb, Sb, S nil = 99.48; sp. gr. 9.47. Microscopical examination shows that it consists of native bismuth with inclusions of native tellurium and apparently of wehrlite. S. I. T.

UKHROV (F. V.). *Weathering of jarosites*. Compt. Rend. (Doklady) Acad. Sci. URSS, 1939, vol. 23, pp. 256-257.

Jarosite usually weathers to ironstones containing haematite, hydro-matite, and other hydrous iron oxides. S. I. T.

SHAFRANOVSKY (I. I.) Шифрановский (И. И.). Сrostки пироклора и циркона из Ильменских гор.—SHAFRANOVSKY (I. I.). *Intergrowths of pyrochlore with zircon of the Ilmen mountains*. Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1938, ser. 2, vol. 67, pp. 229-235, 5 figs. (Russian with English summary.)

Frequently observed intergrowths of pyrochlore and zircon on (11) planes are explained by the homology of the atomic structure of the edges $[1\bar{1}0]$ of zircon and $[11\bar{2}]$ of pyrochlore. S. I. T.

GODLEVSKY (M. N.) Годлевский (М. Н.). Находка калиборита в соляной толще Иnderского поднятия.—GODLEVSKY (M. N.). *Kaliborite in the salt series of the Inder uplift*. Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1938, ser. 2, vol. 67, pp. 258-261, 2 figs. (Russian with English summary.)

Kaliborite is found in association with anhydrite and halite in the Inder salt deposits. Kaliborite is reddish-brown, easily fusible, H. 4, monoclinic, cleavage (100) and (001) perfect, α 1.508, β 1.527, γ 1.549, γ (+) 80° , plane $\alpha \gamma \perp (010)$, $\alpha \parallel [010]$, $\gamma : [001] = 65^\circ$. S. I. T.

GODLEVSKY (M. N.) Годлевский (М.Н.). Анализ парагенезисов, наблюдаемых в Иnderских месторождениях боратов.—GODLEVSKY (M. N.). *Analysis of mineral paragenesis, observed at the Inder borate deposit*. Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1938, ser. 2, vol. 67, pp. 18-30, 3 figs. (Russian with English summary.)

The paragenesis of Inder borate deposits [M.A. 7-122, 123] is discussed in the light of the Le Chatelier law and phase rule.

S. I. T.

ASTASHENKO (K. I.) Асташенко (К. И.). Зунит, зунитовые породы и связанные с ними руды.—ASTASHENKO (K. I.). *Zunyte, the zunyte rocks and associated ores*. Изв. Акад. Наук СССР, Сер. Геол. (Bull. Acad. Sci. URSS, Sér. Géol.), 1939, no. 5, pp. 158-167, 3 figs. (Russian with English summary.)

Additional data is given on zunyte [M.A. 7-462]. It is found in contact-metamorphic rocks (secondary quartzites) and in veins together

with guitermanite, scorodite, enargite, mimetite, and anglesite. A analysis of zunyite from Koshan, Kazakhstan, gave SiO_2 24.95, TiO_2 0.02, Al_2O_3 57.01, FeO 0.16, CaO nil, Na_2O 0.20, K_2O 0.09, P_2O_5 0.3, SO_3 0.22, Cl 2.69, F 5.20, $\text{H}_2\text{O} + 12.15 = 103.00$, less O for Cl , F 100.20. Besides Kazakhstan, zunyite is found in Altai and Azerbaijan.

S. I. T.

[TURTZEV (A. A.)] Турцев (А. А.). К вопросу о дегидратации гипса.—TOURTSEV (A. A.). *On the dehydration of gypsum*. Изв. Акад. Наук СССР, Сер. Геол. (Bull. Acad. Sci. URSS, Sér. Géol.), 1939, no. 4, pp. 180–187, 2 figs. (Russian with English summary.)

Experimental study of the dehydration of gypsum suggests that gypsum is transformed into a hemihydrate (hexagonal) at 82°C . Water of the hemihydrate is of zeolitic character and escapes between 82° and 200° . The dehydrated hemihydrate (soluble anhydrite) represents an end-member of an isomorphous series. The hydration of the anhydrite produces a monoclinic variety of hemihydrate. [M.A. 7–280.]

S. I. T.

[OSTROVSKY (I. A.) & PETROV (V. P.)] Островский (И. А.) и Петров (В. П.). Дисперсия одного флогопита из месторождения «Слюдянка».—OSTROVSKY (I. A.) and PETROV (V. P.). *Dispersion of phlogopite from "Slyudyanka" deposit*. Изв. Акад. Наук СССР, Сер. Геол. (Bull. Acad. Sci. USSR, Sér. Géol.), 1939, no. 1, pp. 105–108, 2 figs. (Russian with English summary.)

A phlogopite from Slyudyanka, Siberia, a chemical analysis of which is given, shows $2V(-) 7^\circ 54'$, $\beta \perp (010)$ for wave-length $450\text{ }\mu\mu$; $2V(-)$ for $545\text{ }\mu\mu$; and $2V(-) 8^\circ 54'$, $\beta \parallel (010)$ for $660\text{ }\mu\mu$.

S. I. T.

GALOPIN (R.). *Différenciation chimique par la méthode "à la touche" des minéraux métalliques polis (3^{me} série)*. Compt. Rend. Soc. Phys. Hist. Nat. Genève, 1935, vol. 52, pp. 252–257 = Arch. Sci. Phys. Hist. Nat. Genève, 1935, vol. 17, suppl. pp. 252–257.
——— (4^{me} série). Ibid., pp. 257–261.

Methods are described for the identification on polished sections, by the method of imprints, of stibnite, bismuthinite, berthierite, bournonite, millerite, breithauptite, niccolite, chalcopyrite, pyrite, and pentlandite. [M.A. 6–377, 7–110.]

M. H. H.

YUSHKO (S. A.) Юшко (С. А.). Применение методов отпечатков в минерографии.—Youshko (S. A.). *The application of the method of imprints in mineralography*. Изв. Акад. Наук СССР, Сер. Геол. (Bull. Acad. Sci. URSS, Sér. Géol.), 1939, no. 3, pp. 137–141, 1 pl. (Russian with English summary.)

A polished surface of ore is pressed against a sheet of photographic paper impregnated with a solvent. In the case of certain ores an electric current must be applied as well. On development with a specific reagent a characteristic print is produced. A list of solvents and developers for fifteen elements is given. [M.A. 6-377, 7-110.]

S. I. T.

VOLYNSKY (I. S.) Волинский (И. С.). Система таблиц-решеток для определения рудных минералов в полированных шлифах.—VOLYNSKY (I. S.). *A system of table-gratings for the determination of ore minerals in polished sections*. Изв. Акад. Наук СССР, Сер. Геол. (Bull. Acad. Sci. URSS., Sér. Géol.), 1939, no. 3, pp. 126–136, 3 figs. (Russian with English summary.)

The principle of grids [M.A. 6-431, 7-406] is applied to ore minerals in polished sections. The 210 minerals listed are placed on 81 cards each corresponding to a definite property (optical, crystallographic, magnetic, electric, chemical, &c.) and the cards are perforated accordingly.

S. I. T.

VIROVLYANSKY (G. M.) Вировлянский (Г. М.). Кварц с реки Пскем (западный Тянь-шань). WIROWLYANSKY (G. M.). *Quartz [from] Pskem-river [western Tian-Shan]*. Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1938, ser. 2, vol. 67, pp. 236–246, 1 pl., 11 text-figs. (Russian with English summary.)

This is a study of the habit of quartz crystals in its relation to the magmatic phases. The earliest type of quartz (obelisk type) is characterized by $(10\bar{1}0)$ modified by the rhombohedral faces, $(10\bar{1}1)$ and $(01\bar{1}1)$. This type is placed between types IIIa and IIIb of W. Maucher (1914). A well-crystallized prismatic type is found to correspond to type IV of Maucher. Type V (Cumberland type) often forms scepter cappings on the obelisk type.

S. I. T.

HEMMLEIN (G. G.). *On the orientation of quartz crystals in the veins of the Alpine type in the sub-Arctic Urals*. Compt. Rend. (Doklady) Acad. Sci. URSS, 1939, vol. 22, pp. 42–44, 1 fig.

The measurement of the orientation of quartz crystals in veins shows

that the majority of crystals have the c -axis inclined to the wall of the vein, while a number of crystals have the a -axis perpendicular to the wall, the positive end of the axis being directed forwards. This is explained as being due to the influence exercised on the growing crystals by the quartz in the schist.

S. I. T.

PÉREZ (Jean-Pierre). *Macles du quartz α après un séjour temporaire sous la forme β* . Compt. Rend. Acad. Sci. Paris, 1939, vol. 209, pp. 173-175.

Single crystals of α -quartz, after transformation to β -quartz and back again, became twinned about [0001]; the positions of the twin boundaries are probably dependent on strains in the crystal. In crystals already twinned on the Brazil law, there is no change in the position of boundaries between d - and l -quartz, but in twins about [0001], the old boundaries vanish and new ones appear.

M. H. H.

ПИТКОВСКАЯ (Z. N.) Питковская (Ц. Н.). *Goyazite in the breccia of the Romny and Issachki salt domes*. Compt. Rend. (Doklady) Acad. Sci. URSS, 1939, vol. 25, pp. 502-503, 1 fig.

Heavy concentrates from the Palaeozoic breccias at these localities in Ukraine contain well-developed, zoned rhombohedra the optical characters of which indicate goyazite: ω 1.634-1.636, ϵ 1.640-1.642, pleochroism, ω pale pink, ϵ pale yellowish or greenish. Chemical tests show the presence of Sr and P.

L. J. S.

SAUKOV (A. A.). *Mercury in barytes*. Compt. Rend. (Doklady) Acad. Sci. URSS, 1939, vol. 22, pp. 254-256.

In a number of barytes from different Russian localities spectroscopic analysis shows from 2.4×10^{-5} to 1.9×10^{-2} % of Hg. Chemical experiments on the precipitation of barium sulphate in the presence of mercury compounds, together with some crystallochemical considerations, suggest that univalent mercury may be an isomorphous component of barium sulphate.

S. I. T.

CHUKHROV (F. V.) & SENDEROVA (V. M.). *Herrengrundite from the Uspensky mine in Kazakhstan*. Compt. Rend. (Doklady) Acad. Sci. URSS, 1939, vol. 23, pp. 165-166.

In old workings, abandoned about 40 years ago, the walls and timber are encrusted with herrengrundite, which is bluish-green on the surface and apple-green on fractures. Analysis, SO_3 24.28, CuO 48.42, CaO 9.14, SiO_2 0.62, $\text{Al}_2\text{O}_3 + \text{Fe}_2\text{O}_3$ 0.34, MgO trace, $\text{H}_2\text{O} + 16.52$, H_2O - trace = 99.32, agrees with $\text{CaO} \cdot 4\text{CuO} \cdot 2\text{SO}_3 \cdot 6\text{H}_2\text{O}$.

L. J. S.